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ABSTRACT

This book reports on research into the role of in-home and out-of-home early childhood education and the effects of both on later academic achievement; also addressed is the question of appropriate age of entry into school. Chapters include: Dilemmas in Early Childhood Policies and Practice; The Role of Parents in Early Learning; The Child's Values and His Self-Concept; The Learning Environment; Neurophysiology: Development of the Brain and Learning; Neuropsychological Factors in Learning; Readiness for School; Age and Academic Stimulation; Sex-Difference Effects; Learning to Read; Effectiveness of Early Schooling; A Positive Approach to Early Learning; and Summary: Issues and Recommendations. Extensive references are included. The importance of the role of the family and home environment in early education is emphasized and it is suggested that education for parenthood and improving the home environment should be primary early childhood education goals. (SB)

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# THE BALANCED DEVELOPMENT OF YOUNG CHILDREN

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# INTRODUCTION

In spite of current trends toward ever earlier schooling or out-of-home care (OHC), there are strong, research-based data which suggest that whenever possible parents should be their children's only regular "teachers" or care givers until the youngsters are at least 8 or 10 years of age. Alternative care may endanger the child socially, emotionally, behaviorly and even academically. In such cases the implications for the family and for society psychologically and sociologically may be disastrous, as parents relinquish their responsibility--and authority--during their youngster's crucial developmental years. Indeed we may be paying heavily to develop problem children, and will pay much more to remediate them--not only in dollars but also in anxiety and loss of human potential.

While much research is still needed to confirm certain hypotheses against unnecessary early OHC, ample cross-disciplinary evidence is in hand to call for policy reform in early childhood education (ECE). Indeed any substantial body of systematic evidence to the contrary is hard to find, and a few leading psychologists believe it does not exist.

It seems appropriate first to lay down the background for these conclusions which so clearly cut across conventional patterns. Then the presentation of the research itself may be better understood.

Background for concern. Consider the rationale for this questioning of ECE trends. In the late 1950's, with the gradual refinement of the science of electroencephalography (EEG), several EEG-based studies of the young child's brain, when brought together, led some neurophysiologists to conjecture that a youngster's central nervous system may not be ready until 8 or 9 years of age or older for the sustained high cortical effort that enables him to learn basic academic skills with relative ease. There appeared to be some possibility that until this age a child may be dominated by his emotions more than by reason.

Inquiry among students of the brain revealed that, because of the state of the art, some EEG techniques and conclusions from available studies might be fortuitous, even presumptuous. Within a few years, however, the influence of psychologist Jean Piaget began to be felt in North America. His experiments were repeatedly replicated with consistently similar results. Of particular note were his stages of cognitive development in the child. His "period of concrete operations" suggested that the child's cognitive ability usually flowered into maturity somewhere between 7 or 8 and age 11, sometimes later. It appeared that until this maturity was reached, the child would not be able to bring consistency to abstract reasoning. He could not consistently relate motivation or cause with effect. Thus when asked to assess the relative "naughtiness" of Jimmy who accidentally broke five saucers, with Johnnie who deliberately and angrily smashed one, the 5-year-old's answer istypically "Jimmy," because "Jimmy broke the most." In other words, the 5-year-old was not yet fully reason-able.

It could be logically hypothesized that since both the visual and auditory perception apparatuses--primary tools of learning--are literally extensions of the brain, they may be limited in terms of the time parameters of brain development. On the other hand, a sound quality of abstract reasoning would be necessary if the child were to bring full and satisfying meaning to academic-type learning such as reading and arithmetic.

There was clinical evidence that 5- and 6-year-olds, and even some of age 7 or 8, had difficulty reading without considerable frustration and with more than rote meaning. This was especially true with young boys. Furthermore, clinical observation suggested that vision and intersensory perception were problems for typical 5- and 6-year-old readers. They would stumble along, using their fingers to guide their eyes across reading lines. But seldom if ever were 8- or 9-year-olds seen doing this unless they had been habituated to it from their earlier years.

Normal children, frustrated with their inability to read with understanding, often turned away from reading. Many others, excited at first with the prospect of school, lost their motivation after a struggle with tasks beyond their years, and by grades two or three or four they had developed an apathy toward school from which they were seldom aroused. Investigation revealed that this experience was common in elementary schools. In fact, some experienced observers such as Claremont's Malcolm Douglass suggested that the deteriorating reading records of California school children--in the range of 45% reading disabled--were due in part to the early schooling practices in that state. Citing the work of reputable researchers, he reasoned that if California schooling were delayed until age 8, there was a likelihood of greatly reducing reading disability; possibly to as few as 2% of the children in some areas (Douglass, 1968).

A combination of reports on neurophysiology and cognition and clinical experience in developmental psychology and remedial reading led a team at the Hewitt Research Center to explore the possibility of a correlational study in neurophysiology and cognition. A study was tentatively designed in which neurophysiologists on the one hand and learning psychologists on the other would independently study common groups of young children from ages 3 to 9. Correlation of their findings was to be made by an independent team of biostatisticians.

Specialists at the United State's National Institutes of Health (NIH) recommended as chief investigator David Metcalf, University of Colorado Medical School child psychiatrist and EEG specialist. It turned out that Dr. Metcalf, well known as a creative but conservative researcher, was vitally interested in the project and willing to undertake it even at personal sacrifice.

By the time the services of Dr. Metcalf were secured, a Hewitt-funded literature search necessary for such a study was already well advanced. The search and analysis of studies in cognition and neurophysiology (including vision, hearing, intersensory perception, and other sensory-motor areas) led to an interest in related areas and opened new horizons. These included social development and affective areas, such as parental attachment, parental attitudes, comparative school entrance age-studies, and comparative cost-effectiveness of preschool and day care intervention vis-a-vis parent education in the home.

In 1971 a sense of urgency arose relative to ECE issues because of the proposed federal early childhood legislation. Much of the effort on the part of the legislators was most laudable, but some of the preschool and day care provisions appeared inconsistent with systematic research findings.

A number of state efforts were also of concern. Research appeared to be ignored or misused at times. The California state school superintendent had gone so far as to declare that the concept of school readiness was now outmoded--a statement that from almost any point of view seemed unwise if not reckless.

Because of urgent legislative needs and on the advice of several consultants, the Hewitt Research Center published a preliminary report of trends and issues in ECE which was conclusive in several respects, although far from exhaustive. With the specific counsel of several distinguished developmental and learning psychologists, an advocacy position was taken. This was first published in the _Phi Delta Kappan_ (June 1972) and then in a popular version through a _Harper's_ article (July 1972). According to the _Harper's_ staff, this resulted in more letters to the editors than any other article in their history, indicating a high degree of concern and agitation about this topic. The _Kappan_ version likewise generated several guest editorials and an ongoing debate in that journal for many months.

In June, 1973, the Office of Economic Opportunity, later the Community Services Administration, at the suggestion of members of the Senate and the House, made a grant to the Hewitt Research Center to facilitate a more complete analysis of scientific literature relating to the ECE-OHC issues. Along with the literature review funds, three joint ECE basic research grants were also made to Hewitt for (1) a correlational pilot study on neurophysiology and cognition at the University of Colorado Medical School, (2) a study of the rationale for state school entrance-age laws, conducted at Stanford University, and (3) an analytical study of relevant data from the National Elementary School Survey involving some 80,000 children, carried out at Andrews University.

All four projects were based on the premise that research and practice must work together if they are to be of any real benefit to society. It was assumed that there must be a common ground of testing, for communication and for interrelating theory and fact for which researchers themselves have a substantial responsibility. In an attempt to meet this obligation the following guidelines or cautions were established for evaluating research and theoretical literature, and clinical findings.

1. Research analysts and consultants may hold divergent views, but they must have prime concern for the welfare of children, with integrity and competence in the field.

2. A simple, clear interpretation should be sought in analyzing any data. Simplicity in reporting findings is not necessarily simplistic. Some of the finest pieces of ECE research have been found hidden in heavy tomes obscured by professional language and statistical anomalies. Every researcher or analyst who produces quality work should feel obligated not only to report data in a technically correct manner, but also to translate it into the language of the common man. Often otherwise little interdisciplinary understanding occurs.

3. Sharing of findings in the various disciplines is a particular need. This is practiced by many scholars. Yet, for example, some outstanding learning specialists, noted for their careful research, have not been well aware of a child's affective needs, and others have apparently not observed the extremely close relationship of neurophysiological development and visual and auditory perception to appropriate school performance. It is an anomaly that developmental specialists have sometimes concentrated so provincially on learning psychology or physiological factors that they have not related to the key implications of social-emotional facets for their own disciplines. It is primarily the interrelating of research in constituent ECE disciplines that gives substance to this book.

4. There is need among ECE specialists for systems orientation--comprising an overall view, yet with goals clearly in mind. Toy manufacturers may promote their products, private preschool operators may lobby for voucher systems, parents may demand "freedom" and labor organizations may want more preschools to provide more jobs. These represent vested interests. But professionals should not be so restricted in viewpoint that they lose sight of the larger goal of optimum development for all children.

Another factor which has skewed ECE perspective is the frequent interpretation of the ghetto. The poor must have help, but groups in higher socioeconomic strata (SES) must not be left without benefit of scientific knowledge lest they, too, succumb to social and personal deterioration and fail to bear their share of society's load. There is little question that some of the greatest early schooling damage has been incurred among higher-SES children.

5. An area related to both items 2 and 4 is that of ECE semantics. When, for example, is a preschool different from nursery school, different from day care, different from kindergarten? At almost any ECE meeting two or three of these terms will be used synonymously. Yet some ECE specialists insist on sharply discreet definitions. Such conflict is self-defeating for the ECE movement. Instead, why not remain flexible and, where necessary, work to resolve these differences with common understanding? All these terms apply to the period before regular schooling, and it may be that so-called preschool in its best form is closer to a typical definition of quality day care.

Likewise, what is the difference between disadvantaged or deprived? handicapped or impaired? We find in one state that children are never retarded, but only impaired. This is fine line talk. On the other hand, we can understand caution about use of such phrases as "lower class" as compared with "middle class." No one of course should be called low class, for low income or low socioeconomic status is not *ipso facto* low class, with the onerous nuance of those words.

6. The date of a study or paper does not necessarily make it good or bad. Despite this fact, many planners are critical

of reviews which utilize findings that are not contemporary. Some are even doubtful of studies more than five or ten years old. To say the least, this is neither scholarly nor far-sighted. Studies should be appraised on the basis of design and validity in terms of stated objectives, and of overall value to a field of knowledge. In fact, well-done studies that have withstood the erosion of time are among our scientific monuments. Some of the best experimentation in the area of reading reaches back several generations. Likewise, a number of excellent studies on school entrance age probe back decades.

7. A scientist or scholar may be criticized for becoming an advocate--whether pro or con on any issue. But if he is convinced of the truth of his position and does not clearly delineate it when faced with contrary practices, then who should do it? It is presumptuous to assume that somebody somehow will come along and happen to do the job. Indeed, what better test can there be of "truths" and scientific techniques than the challenge of advocacy?

8. The attitudes of scholars toward other scholars must be open, with a mutual willingness to examine findings. It may be that a scientist is entitled to envy or criticism of a colleague, but this is inappropriate when done at the expense of children or human welfare in any respect. Scholars often demean their colleagues, sometimes in their own institutions, and then go on to overstate their own findings. Such attitudes in the educational-political realm of ECE may damage the entire ECE cause and destroy the benefits sought for children.

9. A careful analysis of data may lead to unexpected but noteworthy findings. Studies are usually designed to yield information about a specific problem, yet the data collected may also provide insights into related problems. For example, from an international study of achievement in arithmetic (Husén, 1967) an alert analyst observed that the earlier children went to school, the more negative were their attitudes toward school (Rohwer, 1971). Both Husén and his colleague, Robert Liljefors, confirmed this finding from this and later studies (in language and science, etc.) (Husén, 1972, Liljefors, 1974), although the research had been designed for another purpose.

Placing the literature in perspective. An examination of early childhood education literature must necessarily focus on specific aspects of the subject. Yet findings must be interrelated in broad and systematic context or erroneous conclusions and policies may be derived. The sheer quantity of theories, studies, demonstrations, projects and programs of all sorts that have appeared in the last decade have left even some serious students of early childhood in confusion. How, then, can parents and teachers or busy administrators be expected to find their way through such a literary morass? And on what basis can concerned citizens and legislators plan for the best possible opportunities for children to develop into happy, responsible and productive members of society?

Representative reviews have dealt with child development and early learning from a multidisciplinary point of view (Hoffman & Hoffman, 1964, 1966; Hartup & Smothergill, 1967; Hartup, 1972; Caldwell & Ricciuti, 1973). While some of the same areas are examined here, our emphasis is on an organization and interrelation of literature that might suggest new answers to the perplexing questions in early childhood education relating specifically to readings for out-of-home study and care.

It was clear that there was an urgent need to examine those aspects of research and other literature that indicate demonstrable influences on learning in early childhood. Although some references to infancy and toddlerhood have been included to provide a proper perspective, the emphasis is on children's learning and education in the preschool and primary grades from about age 3 through 9 or 10.

In the mass of literature related to early childhood education, it would be impossible to identify all the factors that influence early learning. There are some things, however, that appear over and over again as major determinants of intellectual development. Other things emerge less often, but tend to cluster with related items so that the combined impact becomes an important factor.

Each of the specific areas has been selected because it represents findings indicative of strong influences on early childhood learning. There is much work yet to be done, and it is likely that some major influences on early learning are scarcely recognized at the moment. But from a careful analysis of the literature, the factors that have been identified as major influences on learning in early childhood include

1. The significant people in a child's life.
2. The nature of the material environment.
3. The interaction of people and the environment to provide opportunities for experience and exploration.
4. Values and self-esteem developed within the family and cultural context.
5. Physical, neurophysiological and cognitive development and maturation.
6. Human and environmental resources that help develop the potential of the whole child for learning and living.

In 1972 under the auspices of the Hewitt Research Foundation, we conducted a broad investigation of approximately 3,000 sources in early childhood education research and other literature. From the wide range of areas examined, a synthesis of information was suggested for further study. Many literature reviews are limited in scope to analyses in a specific area so that in-depth treatment is possible, but the Hewitt investigation traced the single idea of school readiness through many areas. The relationships observed in this method of study made it clear that there were powerful and dynamic interactions between the various aspects of early childhood development and learning. And to ignore any of these was to distort the sum of all of them. The Hewitt study related the cognitive development of children to the factors of (1) family, (2) self, (3) culture and home environment, (4) development and maturation and (5) structured learning programs.

The search was initiated by examining existing reviews of early childhood literature to locate references that might relate to influences on early learning. The bibliographies of relevant items were then carefully checked for further sources. Articles published in professional and research journals since 1960 were systematically identified. Unpublished sources were made available by an Educational Resources Information Center (ERIC) search of annotated ERIC bibliographies at the Champaign-Urbana campus of the University of Illinois. In addition, a large number of interested people provided clues to materials that might otherwise have been overlooked. And finally, qualified professionals in early childhood education, representing a wide spectrum of views, were selected as consultants to suggest further references and to critique the project.

These various sources yielded more than 7,000 studies and papers that were screened in selecting the literature to be reviewed. About 1,000 items were closely analyzed and categorized. Those which have been included present a picture of early childhood and learning that is neither new nor startling. It is rather the organization and integration of the areas that clarify some of the current issues in early childhood education.

Scott (1972) cautions that much "research" in education fails to produce new information that can be used beyond the situation in which it is acquired. It is not safe to assume that methods yielding certain results in one place will have the same effect in other circumstances with different teachers and children. Situational variables are responsible for much evidence that suggests trends but does not provide hard data. And in this review some single studies may be inconclusive by themselves. But when the findings of such studies, in concert with the findings of many other studies, all point toward the same trends, the implications deserve examination.

In analyzing literature for facts and trends, and in pointing out relationships between facts and trends, a scholar is always obligated to maintain a regard for integrity and truth. To examine information honestly, a scholar must be alert for clues from any source that may lead to further knowledge. While recognizing the value of careful investigation, he also recognizes that much information is available which has not been adequately investigated, but which, if validated, could add immeasurably to knowledge and understanding.

Although materials of this nature sometimes cannot alone be accepted as fact, they often suggest problems for further study. It is obviously unscholarly, unethical and unwise to wave aside a possible truth because it does not agree with presently accepted knowledge or conventional practice. Some of the trends identified in early childhood literature are provocative in this respect. The human variables are so complex, and the divergent opinions so many--often seeming to depend upon vested interests in a particular profession, or political or social policy--that the real influences on learning in early childhood may be obscured.

There is here a challenge to early childhood scholars to reexamine the early childhood dilemma.

The materials in this review came to light through a systematic search of diverse studies, reports, theories and hypotheses, all tied together by a common denominator of influences on learning and socialization in early childhood. These influences are sometimes unmistakably apparent, and sometimes so masked in the minutia of research detail that only the most perceptive scholars have paused to consider them.

This review, although hardly yet complete, represents a massive search for early childhood information. Conflicting points of view are presented, and conclusions or evaluations have been made on the bases of a consensus of studies or on singularly clear research evidence which has been replicated or in one way or another has been supported by complementary research. If there is any clearly contrary systematic or replicated evidence to the contrary, we will be in the reader's debt to inform us.

Thoughtful critics have suggested additional sources that might have been profitably analyzed. And already, since this manuscript was prepared, further sources have become available which cannot be included at this time. Some trends have been identified and the challenge for an open-minded search for further truth is left with those concerned enough to pursue it, and, whenever possible, to translate it into policy and practice.

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# CHAPTER I

# DILEMMAS IN EARLY CHILDHOOD POLICIES AND PRACTICE

Synopsis. Changes in the structure of society have brought about conditions which pose many problems for early childhood. In an attempt to solve these problems, many kinds of programs involving much planning and great cost have appeared across the nation in recent years. Yet the dilemma persists: What factors, present in early childhood, are the common denominator of later accomplishment and satisfying personal development? We believe research will provide some of the answers to these questions.

A brief review of child study in this century shows a progression, beginning with facts in the early stages, and followed by the study of physical and mental growth measures after World War I. During the depression years this changed to interest in the effects of socioeconomic deprivation on child development and was followed after World War II by emphasis on personal-social development.

In the late fifties, however, the advent of the space age focused attention upon the cognitive functioning and intellectual development of children. It was assumed that accelerated intellectual development during childhood would lead to improved quality of performance throughout life. During the sixties social reform produced the early childhood intervention movement for the disadvantaged. Preschools appeared nationwide and early schooling for all was often urged.

However, the late sixties and early seventies brought doubts as to the effectiveness of these ECE programs. Many scholars questioned the wisdom of preschool education for the masses. Some suggested, instead, strengthening the family structure and educating parents and future parents in the needs and in adequate child care of the child as the means for solving these problems of early childhood.

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The current interest in programs for young children is a reflection of major issues in society. Although there is widespread agreement that something must be done for the nation's children, there is much confusion as to what the real issues are. Meanwhile, early childhood projects and demonstrations have proliferated across the country. Some appear successful in making healthier, happier children. The results of others are puzzling. Gratifying progress has been made as, for example, in identifying needs in child health and nutrition. Yet after spending huge sums of money and tapping the resources of interested people and organizations, many programs seem to have contributed little of lasting benefit to children.

There remain many perplexing early childhood questions. Changes in the structure of society have often stranded children on islands of insecurity. The shift of the population toward urban centers with inner city crowding and poverty, a technological society with increased freedom for women, economic circumstances that seem to make it desirable or imperative for mothers to work outside the home, greater social acceptance of the breakup and restructuring of family units--all these conditions pose problems for early childhood, and demand adjustments which children cannot make by themselves.

So, many of our children need help, desperately. In an attempt to remedy the situation, attention has been focused on almost every imaginable kind of program for the preschool years. For example, some have urged the need for day care only; others have stressed academic readiness. Some have sought to provide a warm, caring atmosphere; and some have been little more than custodial. Some have hoped to provide freer communication between social classes, while others have been concerned for care within those classes. A few may have succeeded in bringing the child greater freedom; others have appeared to be confused about their goals.

Some early childhood programs have made it possible for business and professional women to leave their children and pursue their work. Welfare mothers have also been freed to work, although their earnings have often failed to equal the cost of their children's care at public expense. Such programs for young children have been expected to provide the antidote for all the negative effects of poverty, ignorance, neglect, and general inability or indisposition on the part of adults to meet the needs of children.

In view of all this planning and large expenditure of funds, why have so many children in so many early education programs seemed to profit so little? When children in some programs have made noticeable social and intellectual gains, why have these gains so often tended to disappear after a few years? These questions lead to an even more basic question: What factors present in the early childhood years are the common denominators of later accomplishment and satisfying personal development? Research is continaully in progress and all the evidence is not yet in, but there are trends which might provide answers to these questions.

Early childhood as a field of study. To understand the early childhood issues adequately, it is necessary to consider not only current research, theories and practice, but also the history of early childhood as a field of study and the principles of child development. Since basic principles are viable over time and from culture to culture, they can provide a stable perspective for the examination of early childhood findings and theories.

Such are provided in part by McLean (1954) who reported a brief history of 35 years of research in child development, and Anderson (1956) who summarized the child development movement. Their historical data trace the major emphases of child development studies from early in this century. Anderson noted that a cataloging of facts is typical of the early stages of any life science. This cataloging of structures, functions, and behaviors of the organism serves to locate problems and develop hypotheses for further study.

Observation and cataloging of child behavior was done informally by several psychologists with their own children late in the last century. And studies of children's learning were pursued by Edward L. Thorndike, Robert S. Woodworth and Alfred Binet early in this century. Yet the main impetus for studying children came after World War I. New measurement techniques had been developed during the war and hundreds of psychologists eagerly used them. People were concerned about the physical and mental defects that had been found in servicemen during the war. It was a logical time for beginning a systematic and organized investigation of the growth and development of children.

Studies of physical and psychological development emerged in a number of universities. In 1916 Lewis M. Terman at Stanford began following the progress of gifted children. Measurement of the physical growth of infants and children was begun by Bird T. Baldwin at the Iowa Child Welfare Research Station in 1917, by Arnold Gesell at Yale in the early twenties, and in growth studies by Walter F. Dearborn at Harvard and by Frank N. Freeman at Chicago, also in the early twenties. A monograph on the mental growth curves of normal and superior children was published by Baldwin in 1922.

Funds for research in child development and parent education were made available in 1926 by the Laura Spelman Rockefeller Memorial. As a result a number of research centers flowered.

These included, for examples, the Child Welfare Institute at Teachers College, Columbia University (1924), the Yale Psycho-Clinic (1926), the Iowa Child Welfare Research Station (1927), and Institutes of Child Welfare at Minnesota (1925), Toronto (1925) and California (1927). In these institutes nursery schools were established where children--mostly from 2 to 5 years of age--might be observed and studied. With the help of other funding sources still other organizations emerged which were devoted to the study of children, such as the Merrill-Palmer School in Detroit (1920) and the program in Child Development and Family Life at Cornell (1925).

The emphasis in the research was then largely on measurement--of physical and mental growth curves, of intelligence, language, and social behavior. It seems that practically everything that could be measured at that time was measured, and the results were compiled to give fairly accurate descriptions of children at the various stages of development.

The economic depression of the late twenties gave rise to a new focus in child study during the thirties. The effect of socioeconomic status and child care practices on the development of children became of vital interest. Kurt Lewin's field theories of the relation of children to their environment, and analyses of the family, of parent behavior and of the effects of deprivation were major trends in studies just prior to World War II. Longitudinal studies begun in the twenties began yielding substantial data, and child development as a scientific area for investigation became more firmly established.

The research was interrupted by war, but again, like World War I, World War II brought still newer measurement techniques. Whereas the measurements following World War I had focused on relatively concrete and observable variables, these new measurements spawned by a more technologically complex war turned attention to projective techniques and measurements of the less observable aspects of personality.

Thus during the early fifties a great deal of attention was given to the study of factors contributing to the development of the self. The self-concept became a basic consideration in human development. And by the sixties the literature was replete with self-concept theories and ideals.

In the late fifties, with the advent of the space age, diverse individuals and groups abruptly challenged the education and achievement of American children as inadequate. Within a few years interest in personal-social development was subordinated to an almost frantic analysis of cognitive functioning and intellectual achievement. Whereas going to school and learning had been considered a right and a privilege for all American children, now, in the minds of many educators and policy makers, it became an obligation.

The study and measurement of children for the purpose of discovering how the human organism grows and develops in its various environments was still of interest to some. But this was overshadowed by the new emphasis on ways and means to induce cognitive and social development at earlier and earlier ages. The thesis suggested among other things that the more rapidly a child developed, the better would be the quality of performance throughout life. Many ECE specialists became less and less concerned about what happens to an individual in the normal process of growth and development and more intent on how a society can make happen what it thinks ought to be.

From an extensive analysis of intelligence and experience, Hunt (1961) concluded that environmental encounters might be governed "to achieve a substantially faster rate of intellectual development" during the early years of childhood that would eventually lead to "a substantially higher adult level of intellectual capacity." Hunt visualized environments that would promote a "self-directing interest and curiosity and genuine pleasure in intellectual activity" without the grim urgency of "pushing" children. He further noted that as each child's potential was maximized, individual differences in intellectual development would be increased rather than decreased.

Lip service was widely given to the welfare of children, but in the final analysis teachers and child care workers often submitted to pressure from those in authority, to make children produce. And why shouldn't children produce? Experimental research was showing that they could learn reading and some mathematical concepts relatively early. At first sight it seemed a great waste of human potential not to capitalize on such ability.

This concern coincided with social reforms of the sixties which focused on children who were thought to be disadvantaged. Their environments were perceived to limit the development of sensory awareness so that traditional learning was difficult. It seemed to these theorists, many of them, that the obvious answer was to provide enriched environments, with deliberate early sensory stimulation and exposure to basic concepts, for example in reading and math. Such intervention was expected to help these children keep up with their more advantaged peers. Further benefits were available in child health and nutrition services, and parent involvement increasingly became a key factor in many of the programs.

In 1965 the Head Start movement was born. Many college and university departments of child development shifted their goals from teaching and learning about children to developing curricula and teachers for the new preschools that were appearing from coast to coast in the United States. Many pointed to the examples of European countries which had led in the preschool movement. Several states considered legislation for making early schooling available to all children down to age 3 or 4, and California went so far as to propose that by the age of 8 all children should have mastered the basic tools of learning in reading, oral and written language, and arithmetic (California State Department of Education, 1972).

Yet in the late sixties and early seventies evaluations of the effectiveness of these ECE programs forced some analysts to question if the long-range purposes of early schooling were really being accomplished. Research studies mounted as scholars went to work on the problem; and opinions, some reliable and some wishful, began appearing in popular and professional journals and in news media.

It was not a simple matter to sort out the many facets of the situation. There were proponents of the traditional school viewpoint--build a solid foundation and later learning will be more easily acquired. There were others who were concerned with social action policies and the economics of welfare. Employed and "liberated" women lobbied for child care programs, and teachers' federations were concerned as teaching jobs dwindled with a declining child population.

Legislative proposals became stop-gap measures. Political considerations became overpowering. The child's overall needs seldom were clearly defined, although there was general agreement that families needed counsel and other assistance as well as children. The major focus generally centered on remedy rather than prevention--what to do with families and children in a damaged society rather than seeking the real cause of damage.

Then a series of thought-provoking articles appeared from various sources (S. White, 1968, 1969, 1973; Bronfenbrenner, 1970, 1973; Elkind, 1970; Rohwer, 1971; Schaefer, 1971, 1972a, 1973; Moore, Moon & Moore, 1972; Moore & Moore, 1973, Robinson, 1973). The conclusions of these scholars were reached independently, but they expressed a similar concern. They questioned the wisdom of early preschool education for the masses of children, particularly in terms of academic orientation or readiness programs. Some suggested that rather than removing children further from an already weakened family structure, the efforts of society might well focus on strengthening families and educating parents to provide adequate care for their children.

Some ways of dealing with children which were successful in the past have been found to be quite up-to-date and useful for the present. Perhaps the most important outcome, however, is the realization that children must be valued for what they are and for their potential to become rather than for what society can force them to be.

# CHAPTER II

# THE ROLE OF PARENTS IN EARLY LEARNING

Synopsis. How a child relates to people and to his world is primarily the result of interaction with parents or parent surrogates. This effective tie or attachment makes it possible for a child to define himself as a person, separate yet related to those around him. Premature interference with this tie often threatens the child's stability and the satisfactory performance of his role in society.

Attachments, warmth and loving care influence learning from birth through early childhood and into the school years and the strength and quality of attachment is determined by the amount and kind of care given by the mother or mother figure. This affectional bond gives stability to the child's uncertain world and contributes to a healthy independence.

The home appears to be the best place for acquiring a healthy attachment and at present there is no known substitute for the family in this respect. Frequent interaction with both parents enables the child to accept separation with the least upset. Nevertheless, most children cannot tolerate separation from their mothers before the age of 5 and for those who are insecure, this may continue until age 8 and for some as late as age 10.

Even the best day care cannot completely neutralize the cognitive, emotional and social effects of mother-child discontinuity. Yet there is a clear trend in U.S. child-rearing practices for parents to arrange for out-of-home care. Furthermore, legislators who induce or mandate very young children out of home and into school through school entrance age laws are contributing to this pattern, albeit without any sound or systematic research basis.

Because the child's development and learning are influenced more by the attitudes and child-rearing practices of the parents than by social status or economic factors or by teachers, parenthood education becomes a primary concern for any society which would provide models to which the children can be safely attached.

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There is a current trend for young children to learn more and more about the world in which they live from people outside of their own family in environments theoretically prepared for learning. Preschools of various kinds have burgeoned--nursery schools, kindergartens and a variety of day care programs. Or children may learn from people who are not physically present but who appear in two-dimensional substance on a television screen. According to Yarrow (1973), "today's children are reared by more influences and by fewer significant persons." This trend must be examined in relation to the role of parents in early learning.

Life in a technological culture is often extremely complex and a child's family may not be able to teach him all he will eventually need in order to cope with it. It is true, however, that acquiring the skills to live with technology will have little meaning if one has not first learned to live as a human being. Historically, this has been a major role of parents--to teach children in their early years that they have a place, a responsibility and a worthy future as individual persons in a society of human beings.

The importance of this function of parents and families for the strength of a society is apparent in both history and anthropology. An individual's heredity may be highly desirable or extremely doubtful. His environment may be good, bad or indifferent. But more basic than either of these is the method of dealing with hereditary influences and environmental factors (Anastasi, 1958). This traditionally has been the domain of parents through the years of infancy and early childhood.

How a child relates to people and to his world is still largely the result of interaction with parents or parent surrogates. It is this affective tie developed in close, stable association with a small primary group that makes it possible for a child to define himself as a person, separate yet related to those around him. Premature interference with this tie often threatens the child's stability and the satisfactory performance of his role in society.

While the importance of this primary attachment is generally conceded, there is some disagreement as to when the attachment process is completed. Whether or not the development of attachment extends beyond infancy is an important question if we are to arrive at sound early childhood policy decisions.

Attachment and dependency. Some relatively recent reviews (Ainsworth, 1973; Yarrow & Pedersen, 1972) and a comprehensive discussion by theorist-researchers (Gewirtz, 1972a) provide an extensive background for examining attachment and dependency in human development. The growth of significant interpersonal relationships during the first year of life is generally considered of primary importance for all aspects of later development.

Although the attachment and dependency constructs are not synonymous, they are both centered around what Yarrow (1956, 1964, 1967) calls an "object relationship" or a "focused relationship." Yarrow and Pedersen (1972) define this as a relationship characterized by strong interdependence and intense affect. Bowlby (1965, 1969) and Ainsworth (1963, 1969) simply label a child's affectional tie to an adult, particularly to his mother, as "attachment." Other researchers (Gewirtz, 1965; J. L. & H. B. Gewirtz, 1965; H. B. & J. L. Gewirtz, 1969) have referred to a child's smiling, vocalizing, watching and crying in response to his caretaking environment as "key social behaviors" without limiting their meaning to a concept such as attachment or dependency.

In discussing similar phenomena among animals Harlow and Zimmerman (1959) speak of an "affectional system" or "affectional attachment," while Scott (1960, 1963) uses the terms "primary social relationship," "primary bond" and "social attachment."

These labels all apply to behaviors which share some of the same origins but which may be quite different in purpose and function. To understand the real impact of infant-adult interaction and its potential for positive effects in later development, it is necessary to make a distinction between attachment and dependency.

Attachment has also been defined as an enduring affectional tie that an individual forms with another specific individual (Ainsworth, 1972, 1973). An attachment may change over time, but it is not transient nor does it imply emotional immaturity--characteristics found by definition in dependency. Attachment may be a characteristic of all ages, infancy through adulthood, and it is essential for healthy development and emotional maturity. It implies a discriminating social responsiveness in seeking proximity to one particular person. It is the result of learning by experience from a significant relationship and of being cognitively aware that a particular person exists even though not actually present (Ainsworth, 1972). It in fact carries no connotations of immaturity at any age (Bell, 1975).

Strong early attachments aid in the development of perceptual discrimination (Yarrow, 1972) and sensorimotor intelligence (Bell, 1970). In Geber's study (1958) of Uganda infants, tribal children were strongly attached to their mothers and experienced almost constant interaction with them for the first two or three years of life. According to Geber, they were a part of all the mothers' activities, and their early motor and intellectual development progressed rapidly. The African children showed a lively interest in test materials and maintained excellent personal-social relations with the tester, smiling and trying to communicate with her. Using Gesell measures, by seven months of age African children were two or three months in advance of European children in adaptivity, response to language, personal-social relations and motor development, especially posture. However, Uganda infants brought up in the European way provided a distinctly different picture. Left much of the time in cribs and cared for according to a schedule, they tended to develop according to norms established for Western children, and in some respects were lower than Western children.

While these evidences of early mental development do not necessarily correlate with later intelligence or achievement, they do point up the influence of attachments on learning. Attachments, warmth and loving care continue to affect learning all through early childhood and into the school years (Liddle & Rockwell, 1964; Saltz and Johnson, 1973).

Gewirtz (1972b, c) further refers to attachment as a directional force within an organism which controls behavior by the unique influences of one person. The strength and quality of this attachment is determined by the amount and kind of care given by the mother or caregiver (Ainsworth, 1973; Yarrow, 1972), and it is generally formed only with a single, consistent caregiver (Yarrow, 1972).

Furthermore, an attachment is an affectional bond that gives stability in a world full of uncertainties. The mother or mother-figure to which the child has become attached affords a safe base from which to explore the unknown, a place to which one can return when things "out there" become too threatening. Beyond the first year of life a well-established attachment contributes to a healthy independence (Yarrow, 1972). An emotional stability then evolves that makes it possible for a child to persevere in spite of frustrations (Gewirtz, 1972b), to stay with a task or problem until a goal is reached.

Dependency, as noted, is not synonymous with attachment. In fact, these constructs are related only in that the mother or caregiver is usually the central figure in both systems (Sears, 1972). Dependency is both transient and implies an emotional immaturity as the individual grows older (Ainsworth, 1972). It may be defined as the response to stimuli from any one of a class of persons (Ainsworth, 1972; Gewirtz, 1972b), or it may derive from a lack in parental responsiveness during a child's infancy (McGurk & Lewis, 1972). Dependency originates in the infant's reliance on its mother and other adult caregivers and may be defined as a set of behaviors that denote helplessness. This is natural in infancy. It is age-appropriate behavior, however, and should decrease with time in the course of normal development (Bell, 1975).

Gewirtz refers to dependency as a class of learned behaviors which come under the control of stimuli from a class of persons. This occasions different sets of responses from interaction with different kinds of people. In dependency nothing is sure. The child must then sort out what is acceptable behavior and what can be expected from interpersonal relationships that are frequently changing. The people on whom one is dependent all have different expectations, so problems are met with routine, adaptive responses of low or moderate intensity (Gewirtz, 1972b). Relationships are diffused (Gewirtz, 1972c), and reassurance is sought by seeking help, attention, admiration and approval from any person available (Ainsworth, 1972; Gewirtz, 1972c; Sears, 1972). Bowlby (1965) calls it a "cheerful undiscriminating friendliness" with a "shallow attachment to any adult within the child's orbit." According to Bowlby, such children are extremely insecure and tend to go to pieces when they must function outside a structured environment.

Gewirtz (1972b) suggests that attachment may be a form of dependency which comes under the control of stimuli from one person, or very few other persons. Help-seeking or attention-seeking which results from a diffusion of caregivers, however, is termed socio-emotional dependency and should not be confused with a normal dependence on others for assistance that is really required in ongoing activities. This latter type of dependency is purely instrumental and is used constructively in a great many social interactions.

The determination of attachment and dependency behaviors is rooted in qualitative differences in the mother-child relationship. During the first year of life, these differences not only affect the development of attachment but also influence the development of the cognitive capacity to grasp the concept of person-permanence and to realize that persons still exist as separate entities even when the child cannot see or hear them. Infants with a secure attachment to the mother have been observed to be more advanced in this concept than infants with a disharmonious mother-attachment (Bell, 1970). At first, the biological status of mother and child determines the nature and type of interaction between them. Recurring interaction sequences in feeding, transporting, etc., lead to mutual response patterns. Thus the basis for an attachment is formed (Cairns, 1972).

The best place for acquiring a healthy attachment appears to be a healthy family environment. A child will learn to respond to some extent to all the people who appear consistently within the family, but his primary attachment will be to the one or two who give him the most care. Even when that care is lacking in some things that are usually considered essential, there is at present no known substitute for the family for developing a healthy attachment in children (Ainsworth, 1973).

An attachment that assures stability for the child also makes it possible for him eventually to be separated from the attachment-figure without trauma or protest, especially as he acquires experience and becomes cognitively able to handle the fact of separation. Spelke and colleagues (1973) found that the intensity of an attachment was not reflected in a child's crying when separated from his parent. It seemed that a child was more likely to protest separation when interaction with a parent, in this case with fathers, had been limited. Children who had had frequent interactions with both parents were able to accept the separation with the least upset. It was suggested that children who interacted frequently with both parents had a greater variety of experience in a stable environment and were, therefore, cognitively precocious. This enabled them to accept the fact of separation with more assurance. On the other hand, children with minimal interaction with parents cried the most when separated from them.

In Boston, researchers established an experimental day care program, using a cross section of working and middle-class families, carefully selecting as caretakers mothers with warm nurturing personalities (Kagan, Zelazo & Kearsley, 1976). They established 1:3 adult-child ratios up to age 13 months and 1:5 for those who were older, up to 29 months. The psychologists set up a control group of mothers who cared for their own children at home. The children in the two groups were "carefully matched."

The researchers studied intellectual growth, social development, and the child's ability to achieve a close relationship with the mother. The day care children were in custody seven hours daily, five days a week. They found few if any dissimilarities bewteen the home-reared and the day care children in the three study areas.

The researchers had some reservations, for the fathers were not studied. Nor was there indication that the mothers of home-reared children were as carefully selected as the caretakers of the day care youngsters. The psychologists also suggested that (1) the sensitivity of their methods may not have been adequate, (2) the factors measured may not have included or accommodated the key variables, and (3) the study may not have been extended long enough to have captured emerging differences in the future. It is clear that the careful selection of caretakers in combination with the small adult-child ratios precludes the study from being generalized for communities at large--both in terms of finding so high a quality of caretaker and of prohibitive fiscal costs for low adult-child ratios.

Children 2 or 3 years of age who can accept separation with equanimity, however, may show distress when they discover that they are alone in a strange situation (Gershaw & Schwarz, 1971). They still need the assurance that they can return to a stable attachment-figure whenever necessary.

Although cognitive awareness enables a child to handle the fact of separation, it does not follow that there will be no emotional effect on an older child. When children 13 to 15 months and 2 to 3 years of age were observed in strange situations, both in the presence and absence of their mothers, the constant presence of the mother appeared more necessary for normal behavior with the younger ones. The older children also reacted to the mother's absence, by a decrease in activity and by crying, but they recovered completely in a shorter time than the younger children when the mother returned (Cox & Campbell, 1968).

In the Cox and Campbell study the mother was absent for only a few minutes. There are other studies showing the negative effects of total separation on children in institutions (Bowlby, 1953, 1965, 1967, 1969, 1973; Skeels, 1966; Theis, 1924). In an intermediate area, Blehar (1974) studied the effects of long, daily separations in a day-care situation. She found that there were possible disturbances in attachment and separation distress, and these were a function of the age of the child at the time day care began. Children who began day care at 25 months tended to exhibit a massive detachment. Those who started day care later, at 35 months, maintained their attachment but it was an anxious attachment. It would seem that they were still in need of reassurance from an attachment-figure.

Bowlby (1965) has concluded that most children are not really able to tolerate separation from their mothers before the age of 5. Normally after that, a child who is happy and secure in his mother's love will not be unbearably anxious if the separation is not prolonged. But, Bowlby observes, children aged 5 to 8 who are insecure, doubtful of their mother's feelings toward them and "liable to emotional troubles, can easily be made far worse by a separation experience." They often believe that they have been sent away for naughtiness. This in turn leads to anxiety and hatred which results in a vicious cycle in parent-child relationships. Bowlby (1969) states further that "throughout the latency of an ordinary child, attachment behavior continues as a dominant strand in his life." It is only as adolescence approaches that this attachment to parents begins to weaken.

The stress of separation from an attachment-figure is frequently intensified by an accompanying change in the environment (Yarrow, 1961). For a very young child this strangeness and unpredictability in his surroundings may be as traumatic as the separation itself. Even for older children such novelty and unpredictability heightens the loss of the attachment-figure (Yarrow, 1964).

Just how an early attachment affects behavior at later ages is not yet clear, but according to Ainsworth (1972) clinical evidence suggests that significant relationships exist. And Bowlby asserts that the foregoing dangers from broken attachments may continue until some children are 8 to 10 years old. The deprivation resulting from a lack of attachment may occur at any social level (Ainsworth, 1973), in affluent as well as disadvantaged homes. Ainsworth also says that even the best of day care cannot completely neutralize the effects of mother-child disharmony. The responsibility rests ultimately with the parents, the ones with whom children form their primary attachments.

The anxiety, fear and stress generated by separation from parents may move beyond the creation of emotional problems or neuroses to develop serious learning and behavior problems. It is true that mild anxiety may heighten activity and facilitate learning. But when anxiety becomes acute or chronic it "produces disorganization of cognitive responses" and may result in low performance, erratic conduct and personality disorders (Ruebush, 1963).

When parents actively dislike or are indifferent to their children, then perhaps there might be an advantage in placing these children with surrogate parents. Lewis (1954) noted that some children gained rather than lost from such separations. Yarrow (1964) also believes that a child might be removed from "grossly inadequate parents in a depriving and hostile environment." But Yarrow states further that everything possible should first be done to improve the family situation or the children should be given temporary care in their own homes. Bowlby (1952) concurs on the basis of clinical experience and studies by Simonsen (1947) and Theis (1924) that the home must be very bad before it is bettered by a good institution.

Parent attitudes. The same environmental circumstances that contribute to permanence or non-permanence in a child's life also have some influence on parents' attitudes toward children. For the most part, however, parent attitudes are more deeply rooted in events, customs and personal experiences in their own life history.

An example of an attitude that seems to be associated with early parent-child interaction appeared in a study of the effect of hospital practices on later maternal behavior. Mothers who were permitted sixteen hours of additional contact with their infants beyond what was normally experienced while in the hospital showed an attitude of greater interest and concern for their children than mothers in a control group when interviewed a month later (Klaus, et al., 1972).

Another group of mothers, whose children were left in an intensive care nursery for longer than two weeks because of low birth weight, gave evidence of attitudes related to personality traits rather than to the circumstances of birth and early interaction. Records of these mothers' visiting patterns during the infants' hospital stay showed that disorders in mothering behavior occurred exclusively among mothers with an attitude of little interest toward their child. These mothers visited their infants infrequently--fewer than three times during a two-week period. Mothers who visited their infants more than three times in a two-week period gave no evidence of disorders in spite of the lack of parent-child contact (Fanaroff, Kennell, & Klaus, 1972).

It is quite clear that most parents' attitudes have accumulated from the environments in which they have lived and from association with a great many people and influences. Thus the family, education, religious institutions, the public media, the economy and prevailing status symbols all have their effect on how a parent perceives his child and what he expects that child to be. These attitudes, in turn, influence the quality of a child's motivation, especially as an attachment is formed. Programs of parent education which do not account for these factors are incomplete.

Out of the milieu of social and economic forces parents have distilled their own beliefs that shape the future of their children. Mayeske (1972) concluded on the basis of comprehensive data from public schools in the United States that children's motivation for learning is primarily social in nature and origin, and the beliefs and aspirations of parents are a greater influence on school achievement than social status or economic well-being. Durkin's (1962) study of 5,000 California school children confirms this in that those youngsters whose parents provided many books and similar learning materials generally excelled in reading.

There are differences in the learning and achievement of children with different socioeconomic backgrounds, but these appear to be more a function of the attitudes of parents and of aspects of the lifestyle that are not entirely dependent on economic factors. For instance, the results of an investigation (Brophy, 1970) of the way in which mothers attached meaning to their own and their children's behavior in a mother-teaching task implied that the greatest differences among socioeconomic groups in stimulating their children to learn were in the areas of guidance and enrichment.

A Brandis and Bernstein (1974) analysis concludes that parents of middle and lower socioeconomic status differ significantly in their attitudes concerning the adjustment of their children to school and differ in the preparation of their children for school. They also differ in their attitudes toward work and play and toward the use of toys by their children. There are major differences between the social classes regarding the value of books and reading, and this is apparently related to learning abilities. In all of these aspects, a child from a low socioeconomic level is usually at a decided disadvantage when compared with middle-class children.

McCandless (1967) noted that an effective environment for a child was one to which the child had sufficient maturity to bring meaning. Even though a child may be surrounded by stimulating toys and materials, he may lack the stimulation to learn when things are beyond his ability to experience. A simple but organized environment to which a child can actively relate probably provides the greatest stimulation for learning. For this reason, poverty-level homes may provide as much stimulation for children as those that are more affluent, especially when activities are experienced in a satisfying relationship with a parent or other adult. The family and home influence is more likely to be a better predictor of educational functioning than socioeconomic status (Krus & Rubin, 1974).

Furthermore, many low-income parents have educational and occupational aspirations for their children equal to those in higher income groups. And they strongly believe that they have a responsibility for their children's learning (Levenstein, 1971). But they, as well as parents of other socioeconomic levels, need help to know how to proceed. As suggested by McCandless (1967), parents should develop attitudes about their value and use of the simple things available to them. And above all, they must develop positive attitudes about their own worth as parents and the effect of their interaction with their children, if they are to provide optimum care.

Mothers in low socioeconomic status groups sometimes feel that they have little influence on the development of their children. They may see themselves as powerless and unable to change things (Minuchin, et al., 1967). The attitude of parents toward such a simple thing as talking to a child may set the stage for positive or negative development in the future. Weikart and Lambie (1969) found that some low-income mothers considered talking to a baby silly and unimportant. Failure to understand that infants can communicate with other people and can express definite emotions can result in a lack of maternal stimulation and in turn hinder cognitive development (Tulkin & Kagan, 1972).

Early mother-child interaction is an essential factor in the young child's language development, and the quality and consistency of this interaction affects profoundly his communication competence. A child responds to communication before he understands words. His mother shapes his information processing strategies and influences his future mental growth and personality development through her linguistic and regulatory behavior. If this mother-child relationship is inadequate or incomplete, the child's language development may be retarded (Weininger, 1975a). The influence of sociolinguistics on the learning of the young child is emphasized by Brandis and Bernstein (1974) who found that the measure of reported communication and control by the mother before the child goes to school shows an increasing relationship to the teacher's judgment of the verbal behavior of the child at the end of his second school year.

When parents are themselves frustrated or apathetic, when life is unrewarding and apparently futile, there is a tendency to be satisfied with a low level of child care. In a study of Appalachian mountain mothers (Polansky, et al., 1970) such feelings resulted in social withdrawal, lethargy and declining intelligence in children. In addition, impulsiveness in some of these mothers was linked with a way of life that made children hostile and defiant by the time they were 5 years old.

It must be emphasized, however, that children of low socioeconomic status are not the only ones who may suffer from parental attitudes toward their learning. Children from high and middle levels of society often suffer from parents who go to the opposite extreme. These children are sometimes under such tremendous pressure from their parents to achieve that they succeed academically at the expense of mental health. Some retain life-long feelings of neurotic strain while others succumb to psychosis or severe neurosis (Levinson, 1961).

That children perceive the attitudes of their parents and behave accordingly is illustrated in the findings of Darvin Miller (1972). In this instance children's perceptions of their parents were significantly related to their social behavior in a nursery school. Parents who were perceived as accepting their children fully and who were also firmly in control, exerted this same assured influence on their children. These children exhibited positive social behaviors and a certain independence that might logically be associated with the security that comes from positive parental attitudes. Conversely, children who perceived their parents as punitive and/or over-indulgent tended to be dependent, with negative social behavior.

In relation to learning, children's awareness of their parents' attitudes is closely linked to their intellectual development. The education and IQ of the mother seem to be less significant in this respect than the mother's attitude toward herself (Hess & Shipman, 1968) and her expression of maternal warmth (Levenstein, 1969; Radin, 1971). Radin, in fact, found that a child's ability to respond even to a compensatory program was greatly affected by maternal warmth. Schulz (1972) suggests that by inferring that children may do poorly in school if they do not go to school early, we build a fear of failure into both parents and students.

Early learning in preschool boys who were observed with their fathers correlated definitely with father behaviors, particularly in relation to acceptance-type attitudes and restrictiveness. Boys gained significantly in IQ when fathers used reinforcement and consultation and also demonstrated sensitivity over a period of time. But boys whose desire to explore was apparently blocked by their fathers showed only limited cognitive growth (Radin, 1973).

Restrictiveness which limits exploration must be differentiated from the necessary limits imposed upon a child for his own safety and for protecting property and the rights of others. The security of knowing that there are limits, yet with freedom to explore within them, actually helps a child to achieve. Radin and Kamii (1965) discovered that it was this attitude in middle-class mothers that led to a high probability of their children's success in school. But the attitudes of low-income mothers often tended to be self-defeating. They were inclined to be protective and intrusive, and to control their children with little respect for them as individuals (Minton, Kagan & Levine, 1971; Olmsted & Jester, 1972).

Yet a thoughtful, informed firmness appears to produce good results. Drews and Teahen (1957) found that mothers of high academic achievers were more authoritarian with their children than mothers of low achievers. Mothers of high achievers appeared to know what was best and their standards were accepted by their children. This is in contrast with dominating, intrusive and coercive parental attitudes which had a negative effect on children's apparent intelligence (Baldwin, Kalhorn & Breese, 1945; Hurley, 1959; Blum & Chagnon, 1967; Bercovici & Feshbach, 1973).

Child-rearing practices. Whether a child-rearing practice can be termed "good" or "bad" depends of course upon the criteria used. Key among such evaluation standards are the physical and psychological health of children as they grow up in their own particular culture. Basic early physical and psychological needs are much the same in every society, but are met with varying degrees of success depending upon the prevalent customs of child rearing (Stone & Church, 1973).

The most basic of these needs include (1) opportunity for physical development and health--with strong concern for sound nutrition; (2) learning to communicate through language; (3) acquiring concepts basic to the organization of the culture--relating to time and space, using tools, expressing emotion, learning accepted behaviors; (4) identifying one's self as an individual, first in the family and later in the larger society; and (5) relating to reality, existence and the supernatural through religion or some metaphysical orientation. This latter aspect of child rearing is concerned with the inculcation of values, morals, ethics, and attitudes regarding life and death, including sex conduct and the ultimate purpose of human existence.

In meeting needs that convey a heavy emotional impact involving personal identification, values, and the basic issues of life, the parent or other principal caregiver exerts a strong influence. Spitz (1949) found that this child-adult interchange is the central psycho-social factor in an infant's life. This raises important questions concerning the widely-held thesis that young children make their most rapid gains when placed out of home in a group of their peers.[1] In areas of intense feeling the confidence and affection of the involved adults are more important than the actual child-rearing techniques. The maturity of the parents and their own psycho-social responses are the most influential factors in child-rearing success.[1]

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[1] See "Issues and Recommendations," Chapter 13, on "Home or School Socialization of the Child."

Baumrind (1967) found that firm, loving adults--demanding but understanding--generally help children become self-reliant, self-controlled, competent, mature and buoyant. And the spontaneity of such children was not affected even by adversely high parental control. Baumrind noted, however, that parents who were firm, but with punitive and unaffectionate attitudes, could affect their children adversely. Such children tended to be anxious, restless and alienated from their parents. Children of moderately loving parents who lacked consistency and control were dependent and immature. Such uncertainty in parental control was apparently reflected in unsureness of child behavior.

Spitz (1949) referred to a similar effect. Mothers with an infantile personality, shifting between hostility and overprotectiveness, had children who were slow to respond socially and were also slow in acquiring manipulative ability. The solution advocated by Spitz was education for parenthood, especially for mothers. He suggested that legislation be arranged so that mothers could stay with their children.

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[1] The psycho-social maturity in parents urgently calls in turn for a high degree and quality of parenthood education.

But nearly twenty years later a study of child-care arrangements in the United States (Low & Spindler, 1968) showed a trend in the opposite direction. The number of mothers who found it necessary to arrange for the care of their children while they worked had steadily increased.

At the time of the Low and Spindler survey, 25% of all U.S. mothers living with their husbands and having preschool-age children were in the labor force. Twenty percent of the mothers living with their husbands and having children under 3 years of age were working. In addition, a great many widowed, divorced or separated mothers of young children were also working. This survey showed a clear trend in U.S. child-rearing practices to arrange for out-of-home child care.

But the employment of mothers is not the only reason for advocating out-of-home care. Those who are concerned about children's learning give a more pragmatic reason, especially for children from disadvantaged homes. Declining IQ scores among the disadvantaged seem to be related to the emotional effects of child-rearing conditions. Wiener, Rider and Oppel (1963) concluded that "something happened to lower-class children after the age of 3 that was both emotionally disturbing and intellectually impairing." Their data suggested that child-rearing conditions were the cause, but the specific variables were not determined.

And a study of school entrance-age laws (Forgione & Moore, 1975) strongly suggests that legislatures which induce or mandate little children out of home and into school, do so without any sound or systematic research basis. They appear to be almost capricious in their use of early childhood data.

Umberto Nagera (1966), director of the Child Psycho-Analytic Study Program of the Children's Psychiatric Hospital, University of Michigan Medical School, made a direct connection between early childhood emotional disturbances and certain child-rearing practices. He used the term developmental interference to refer to "whatever disturbs the typical unfolding of development." Unjustified demands made of a child in early and rigid toilet training, inflexible feeding routines and premature mother-child separation with lack of maternal stimulation were identified as having a potential negative emotional impact.

Aspects of child rearing that are entirely normal at the appropriate developmental level can become serious interferences when demands are made which the child cannot handle. Nagera noted that culturally determined interferences, such as behavior expected of children at a particular age, may be actively imposed upon a child without regard for individual development and needs. Because of differences in individual rates of development, a demand made of one 5-year-old, for example, may be beyond the ability of another 5-year-old and may be totally inappropriate for a 3-year-old. These inappropriate demands disturb the normal course of development and eventually hinder rather than speed up the developmental process.

In the early 1970's Martin Engel (n.d.), then director of America's National Day Care Demonstration Center in Washington, D.C., declared that

> The motive to rid ourselves of our children, even if it is partial, is transmitted more vividly to the child than all our rationalizations about how good it is for that child to have good interpersonal peer group activities, a good learning experience, a good foundation for school, life, etc., etc. And even the best, most humane and personalized day care environment cannot compensate for the feeling of rejection which the young child unconsciously senses.

Interaction variables. The overriding importance of positive, consistent parent-child interaction is strongly evident in the literature related to early childhood learning--far more than is commonly understood. Certain of the variables that influence the effect of an interaction are (1) the degree and quality of the involvement of child and adult, (2) the autonomy or restrictiveness engendered by the interaction, and (3) the stability and firmness or the inconsistency and indulgence on the part of the adult.

Children from stable homes with a considerable degree of contact with their mothers may be expected to form strong attachments. Little, Kenny, and Middleton (1973) found an interesting circumstance when relating this type of child-adult relationship to the development of intelligence: A strong interaction with parents in stable homes was positively related to an increase in IQ over time. On the other hand, children from less stable homes appeared, for some reason, to have higher IQ's at age 4, but by the age of 7 the situation was reversed. Furthermore, children from stable homes with many opportunities for interaction with their parents showed a significant rise in IQ, and those from unstable homes with less opportunity for positive interaction had a significant decrease in IQ. As the children grew older, the stability of the home and contact with parents became increasingly important in producing cognitive gains.

Although a considerable amount of parent-child interaction appears to be desirable, smaller doses are far better than none. Saltz and Johnson (1973) found that an experimental group of children 1 to 6 years of age living in an institution definitely benefited from part-time "mothering" by foster "grandparents" over a period of several years but without any special stimulation. Their control group of institutionally reared children did not have this "mothering" but were given much general environmental stimulation. While this stimulation was somewhat effective, these children gained less in IQ than those who had "grandparents" and no special stimulation. These findings appear consistent with those of Skeels et al. (1938) whose orphans, mothered by retarded teenagers, developed rapidly in intelligence.

On the other hand, there are many adults who exercise authority over children without sufficient interaction to develop a real attachment. This may be true when older siblings and other adults (besides the parents or caretakers) are present in the household and an unnecessary spirit of competition is generated in the home. Under these circumstances Abramson (1973) observed the expression of violence in fantasy by the child. According to Tulkin and Kagan (1972), children interacting with a number of adults other than their own mother may actually be less likely to be involved in the activities of the home--not so sure to explore and manipulate their environment in the home.

According to Sylvia Bell (1971) the quality of exploratory behavior, which begins in infancy, is influenced by the quality of the mother-child interaction. This affects both the child's attachment to its mother and its early cognitive development. Mary Ainsworth shares with Dr. Bell the research-based conviction that cognitive and social development are intimately interrelated, and the mother-infant interaction influences both (Ainsworth & Bell, n.d.).

During the child's first eight months the maternal qualities of sensitivity and appropriate responses to infant signals were found by Bell (1971) to affect significantly all aspects of cognitive development. In the last quarter of the first year, and possibly thereafter, cognitive development is fostered by the same maternal role coupled with conditions that permit a child to explore its surroundings, to initiate action on the environment and to receive feedback on its actions. And the quality of this exploratory behavior stems primarily from the mother-child relationship.

Factors in the quality of parent-child relationships that have been shown to have a positive effect on children include such variables as acceptance (Miller, D. L., 1972), warmth (Levenstein, 1969; Radin, 1971), happiness (Milner, 1951), expression of affection (Milner, 1951; Baumrind, 1967), and firmness of control (Baumrind, 1967; Baumrind & Black, 1967; Drews & Teahen, 1957; Miller, D. L., 1972). All of these appear to be integral parts of happiness-inducing experiences. And, according to Milner (1951), the awareness of such happy experiences in parent-child interactions was a characteristic of children with high mental maturity scores.

On the other hand an investigation by Roff (1971) of specific factors in parent-child relationships that were predictive of adult neurosis pointed heavily to kinds of parent-child interaction that were quite the opposite of these happiness-inducing qualities. In fact the families of neurotics were differentiated from other families primarily in terms of the subtleties of parent-child interaction. Neurotic adults generally reported that they had experienced in their childhood parental neglect or repudiation and lack of affection. Some reported that their parents wanted to be rid of them, and some parents exhibited vigorous physical violence. So the evidence suggests that adults largely determine child behavior by the quality of the interaction which they build. Bronfenbrenner (1973), in his discussion of the social ecology of human development, seems to concur.

Parents' responsibility. In order to assure positive conditions and motivation for their children's learning, the first responsibility of parents is to understand as best they can their own relationship to their children and their needs. Robert Hess (1969) sought to identify the things mothers could do that would develop cognitive ability and educability in their children, even in poor environments. He concluded that the mother's own behavior and cultural background was the influential factor. Although mothers' backgrounds cannot be basically changed, mothers can form attitudes that have a strong, positive influence on their children's emotional and physical environment, even in extremely limited circumstances.

Regardless of social class, parents can be helped to use their own abilities as parents and as their children's earliest teachers. Miller (1969) found differences related to social class in the teaching effectiveness of mothers largely because of differences in their teaching styles. In all social classes he found that mothers used varying degrees of specificity in communicating with their children, but mothers in the lower socioeconomic levels tended to be less specific and precise, conveying a more passive attitude. This tended to have a negative effect on their children's cognitive development.

From work with disadvantaged children, both black and white, Liddle and Rockwell (1964) asserted that the most important learnings in life began in the family. When children lacked loving care they were unprepared to succeed in a traditional school situation. According to Liddle and Rockwell, such children may have had no idea what education was all about or why they were in school, and it was difficult to achieve when expectations were not clear.

Schaefer (1972b) observed that children model parents in attitudes, moral knowledge, vocational interests, and personality. This suggests that the influence of parents on children is greater than that of teachers. A logical conclusion would be that teachers should work to effect desired changes by teaching the parents and trusting them to develop in their children the attitudes and motivations necessary for learning.

On the basis of literature reviewed, Schaefer reached the conclusion that parents must be taught skills for educating their own children in their early years. Gordon (1971) recognized that the "overwhelming influence of deleterious life circumstances" can be a real obstacle for parents who are willing to assume the responsibility for their children's early learning. These parents need help in mobilizing their own potential and that of their environment to meet the developmental needs of their children.

Schoolroom assistance by parents is not the same as their direct interaction and teaching of their children themselves (Hess, et al., 1971). Nor are ignorance and poor attitudes effectively remedied simply by involving parents in school-home programs for their children. This was strongly suggested by a follow-up study of mothers involved in Head Start programs (Clarizio, 1968). Parents need more than participation in their children's educational activities. They need education themselves, education showing them how they can be effective influences in their children's development.

The preponderance of evidence indicates that the key role of a parent throughout the years of childhood is simply to be the kind of person to whom a child can safely become attached. Early development and learning are actively dependent on this relationship. Parents are chiefly responsible for a child's early learning by their attitudes and responses to the child in frequent interactions. There is a conspicuous dearth of evidence to show that this role can be successfully assumed by anyone else except by parent surrogates or attachment figures who become very much involved with a child on a relatively permanent, continuous and consistent basis.

# CHAPTER III

## THE CHILD'S VALUES AND HIS SELF-CONCEPT

*Synopsis*. The child's values and his self-concept are inextricably bound together and also are concurrent in their influence on learning. Thus a major task of early learning is an individual's defining of the self and his identification of values.

The role of parents is crucial in establishing a sound sense of worth in a child and the building of its value structure. This is best accomplished by the example of the parents themselves. Apparently during the first six years of age the child absorbs the values of his family, although the full understanding of these values may not be fully grasped until adolescence or later. The influence of the family, especially the mother, appears to be of prime importance in establishing and maintaining values and the associated self-concept.

In order for children to function effectively in the peer group they need to comprehend reasonably their social identity within the primary family group, and age seems to be a significant factor in their understanding of the structure of the family and their place in it. In less than a generation the shift from parents to peers as the primary models appears to have moved substantially down from about grade 7 to early grades, and it is believed that social contagion--the imitating of attitudes and activities of peers--is already well-developed at the preschool level. Such peer orientation seems to have negative effects upon the attitudes and behavior of young children. This is consistent with findings that children who started school later (and therefore came under the influence of their school peers later) tended to be superior in achievement, behaviour, sociability and leadership.

When the child has to adapt to the outside world, he will not be threatened by the authority figures who control his environment if he has a positive sense of self-worth nor will he be vulnerable to peer pressures if he has strong, internalized values and standards.

There is an abiding need for developing in the young the values and self-worth necessary for social competence. Yet early socialization in the family context is being undermined by younger and ever-younger out-of-home care with the result that children are left to rear each other socially, gaining their values and a sense of worth randomly from their ever-younger and more insecure peer group.

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The success or failure of academic learning appears to be influenced to a great extent by the child's concept of himself (Brookover, Patterson & Thomas, 1962, 1964; Caplin, 1966; Brookover, 1969; Gill, 1969), and since self-awareness originates early in life (White, 1959; Farber, 1962; Coopersmith, 1967) it must be considered an important and integral part of early learning.

ECE researchers and scholars have proposed a variety of hypotheses on the development of a high quality of self-worth in the child. Weininger, for example, (1975b) believes that the concept and awareness of one-self is related to body image and that body image seems to be a function of certain kinds of early experiences. These experiences include exploration of the body, masturbation, and wounds.

But the child does not come by these concepts alone. He is no island. The views of those about him are often key influences. The reaction of parents,* particularly the mother, toward these experiences, is a prime factor in the child's growing awareness of self (Brazelton, 1974).

Elementary children as a group have difficulty maintaining positive self-concepts after they are enrolled in school (Stanwyk, et al., 1971). Felker (1974) reports a study of suburban middle-class children in a relatively new school and with an excellent faculty: from the time of the children's early entrance to school at kindergarten or first grade, they showed a steady downward trend of self-concept as they met the pressures of the early school years--until about grade 5 when their self-concept began to improve.

The self-concept is also closely associated with value orientations (Wylie, 1961). In fact, the child's self-concept and value system are likely to have the same origins (Hoffman, 1963). Wylie notes that terms applied to self-esteem, such as self-respect and self-acceptance, also carry value connotations and are sometimes used interchangeably.

Not only do values and the self appear inextricably tied together, they are also concurrent in their influence on learning. As long ago as 1890, James recognized that personal values largely determine the worth attached to one's self--the measurement used in self-judgment and in evaluating personal achievement. Over 75 years later Coopersmith (1967) provided essentially the same joint appraisal of values and self. He concluded that experiences are interpreted and modified according to the values and aspirations of the individual. If the individual lives up to his values, he generally maintains a high degree of self-esteem.

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*While our references to parents primarily concern mothers and/or fathers, care should be taken to evaluate the suggestions from cited studies also in terms of parent surrogates.

The values that interact with this achievement of self-esteem, however, do not represent objective, established data but are the personal values and convictions acquired by an individual through his unique life experiences. Thus a major task of early learning is the individual's subconscious defining of the self and the identification of values which become the foundation for later learning.

Awareness of self. The earliest, distinct awakenings of the self originate from the quality of care and personal trustworthiness experienced by the infant through its caregivers (Erikson, 1950; Sullivan, 1953). It is upon this basic sense of identity that the child moves on to acquire a sense of being "all right"--of being what other people expect it to be.

As experience accumulates and attachment to significant adults develops, the infant's awareness of himself as a person with an individual existence becomes more firmly established. Purkey (1970) observes that during its first year the baby finds boundaries between its body and the outside world. It gradually learns to discriminate "me" from the "not me" and attributes intention to the acts of others.

Even during the first few weeks of life a baby begins to sense its own worth in the awareness of others' appraisals. Approval, warmth and affection carry the message that it is wanted, loved, and valued as an individual. Or on the other hand, pity, concern, hostility, coldness or disapproval give rise to feelings of negative worth, of being unwanted and of little value. There is considerable support for the role of parents as crucial in establishing a sound sense of worth in a child (Manis, 1958; Davidson & Lang, 1960; Shaw & Dutton, 1965; Meyers, 1966; Coopersmith, 1967).

Now enters a factor which calls for far more wise and objective attention and effort than has heretofore been demonstrated by educators and early childhood specialists. A parent whose own sense of worth is well established will, of course, find it easier to transmit a positive self-concept to his child. The parents' acceptance of each other as worthwhile persons will also influence the acceptance they provide for their children (Farber, 1962). Since it is only as a child perceives himself fully accepted and since parental approval is primary in this perception, the climate they create must be a positive one if a positive sense of worth is to flourish.

Tocco and Bridges (1973) have also demonstrated that a child's self-concept bears some relation to the parents' self-esteem and concomitant attitudes, such as those toward teachers and schools. Mothers from a deprived level of society representing black, white and Indian ethnic groups had a definite influence on their children according to their level of self-esteem and their view of teachers and schools. Mothers with high self-esteem had a more positive view of their children, of teachers and of schools. Their children, likewise, had high self-esteem and a positive attitude toward school. Studies by both Daugherty (1963) and Mildred Smith (1968) seem to suggest that parental self-concept and attitude toward schools can with care be remarkably improved.

The findings of Bledsoe (1967) indicated that boys generally have a more difficult time establishing self-esteem than do girls. Bledsoe found elementary school boys to be significantly lower than girls in self-concept scores, and these scores correlated with both IQ and achievement for the boys but not for the girls. It may be that girls desire more social approval than boys, and respond to measuring instruments in a way that produces error variance rather than genuine measures of self-concept. Chapter 9 provides further insights on sex differences which may relate to relative maturity levels of boys and girls and their possible influence on self-worth, particularly in western societies.

A study reported by Girona (1972) provides further support for the idea that personality variables related to self-esteem may be influenced by emotional involvement with significant adult figures. For 10 weekends college students carried out special activities on a one-to-one basis with 6- to 9-year-old children from an institution. In that brief period, the children showed a significant progressive increase in sense of worth and willingness to assume responsibilities. The interest and attention of the college students also effected positive changes in the children's intelligence scores and lessened their dependent need for nurturance.

Awareness of values. So children become aware of values as they become aware of themselves, by interacting with significant people in their lives. This is consistent with and supportive of the well-established fact that children learn best by example. Parents and other adults with a firmly based system of values can provide a strong foundation upon which children can be free to build their own value structures.

Parents with a sound sense of values do not find it necessary to immortalize themselves in their children (Allen, 1958). And children who receive positive acceptance and respectful treatment from their elders are far more likely to accept the values of their parents and worthy elders

(Hoffman, 1963). This is essentially a restatement of the fact that the same conditions that produce high self-esteem, acceptance and regard as a person of worth, tend to produce stable and realistic values (Coopersmith, 1967).

The values of adults become apparent in the quality of their treatment of children--their consistency, warmth, responsiveness and the kind of behavior which they foster or permit. This, in turn, gives rise to rudimentary values in the child, to an awareness that certain rewarding experiences contribute to the good-me while anxiety-producing or forbidden behavior more often belongs to the bad-me. Then there are those aspects of life which one hardly dares admit to his conscious mind, experiences of such intense anxiety associated with "such awe, horror, loathing or dread" that they are relegated to a personification of not-me. These experiences are not clearly connected with cause-and-effect and remain well in the background as guides for organizing future behavior (Sullivan, 1953).

The good-me and the bad-me are common, however, and can be well understood. From these concepts of himself a child begins to distinguish between right and wrong, to identify the values approved by the significant people in his life. In discussing a child's growth toward maturity, Neubauer (1956) says that a child absorbs the values of his family between the ages of 4 and 6. It is at this time that he begins to ask, "Who am I?" And he finds his first social identity within the family group.

Values, self and the primary group. Within the family group a child first learns that people need each other. He receives care, but he also learns that he can contribute to the care of others as he becomes capable of doing so and can cooperate in family endeavors (Jenkins, 1956). Interaction within a primary group of closely knit persons without deliberate or regular interference from other individuals or institutions gives the self an opportunity to develop and establishes more firmly for a child the values that govern the group.

Although family values are absorbed during the preschool years, there is evidence that the real understanding of these values increases with age (Edwards, 1974). Indeed, a full understanding of the moral issues involved may not be attained until adolescence or later. Edwards found that in general children probably do not have a clear grasp of certain moral concepts before the age of 15.

Edwards also confirms the view that the influence of the family, especially the mother, appears to be of prime importance in establishing and maintaining values and the associated self. In his study, which included 700 children aged 7 to 15, the influence of the mother in the acquisition of moral knowledge increased as the children grew older. This primary group influence was not generally supplanted by the peer group, even into the teen years, as had been expected.

Although family values are dominant in a child's pattern of beliefs and values, these values may be so hazy in both articulation and practice that the child never knows for sure what they are. Or a child may absorb conflicting values from other significant people in his early years if there is a low level of value agreement within the family. And there will usually be difficulty reconciling values as understanding increases. This is supported by the findings of Van der Veen et al. (1964) in a study of the congruence of value orientations held by parents and the self-images of the family members.

The peer influence. Finding one's place in the peer group is a highly essential part of growing up in all cultures. This process of social identification outside the primary group, however, will often threaten self-esteem when there is conflict between personal values and group values, as Coopersmith (1967) indicates. In general, people tend to judge their personal worth by values espoused by the group. Thus the social norms of the group often become internalized as self-values.

In 1959 Charles E. Bowerman and John W. Kinch worked with a sample of several hundred students from the fourth to the tenth grades in the Seattle public schools. They studied age trends and the tendency of students to turn to their parents on one hand or to their peers on the other for opinion, advice, or association in their activities. In general, they found a turning point at about grade 7. Before that, most of the students looked primarily to their parents as their companions and their models for behavior, but after that the peers seemed to have as much or great influence.

About ten years later Condrey, Siman and Bronfenbrenner (1968) made a similar study on parents and peers as influences on their children. They found a larger percentage of peer independence at each age and grade level than did Bowerman and Kinch. It seems, as Bronfenbrenner (1970) and others have concluded, that the shift from parents to peers is not only much more pronounced, but has moved down to earlier grade levels. Bandura (1961) and others at Stanford University have conducted experiments which suggest that the imitating of attitudes and activities of peers is already well-developed at the preschool level. Brofenbrenner refers to this as social contagion.

Bronfenbrenner found that peer-oriented youngsters described their parents as "less affectionate and less firm in discipline." This attachment to peers seems to be influenced more by a lack of attention and concern at home than by the strength of attraction by the peer group. In fact, such children who have the peer orientation seem to have a rather negative view of their friends and of themselves, tend to be pessimistic about the future, are less likely to accept responsibility and leadership, and have a greater tendency toward errant behavior. This is consistent with Forester's (1955) findings that children who started later in school (and therefore came under the influence of their school peers later) tended to come out better not only in achievement and behavior, but also in sociability and leadership.

Thus children are frequently expected to function effectively outside the family in a peer group before they reasonably comprehend their social identity within the primary family group. Sweet and Thornburg (1971) found that age was a significant factor in preschoolers' understanding of the structure of the family and their own place in it. The older the children were, the better they could identify and understand familial labels--good, bad or indifferent--and their own relation to them. White children did better than black children, but the reasons are not yet clear. Whether this was indicative of family structure or of communication ability or of other variables was not determined.

The influence of the family, and of mothers in particular, appears to be related to those self-perceptions and aspirations associated with academic achievement. Webster (1965) drew such conclusions in a study of adolescents, but the family behaviors that led to these findings were identified as attention and support shown by mothers when the children were 6 to 10 years old. The greater the amount and higher the quality of this early attention, the more favorable were the youngsters' later self-perceptions.

And there are yet other developments which spotlight the primary group as the provider of stability and acceptance that can be taken for granted by a child. For example, neurological data indicates that small children often have difficult in "reprogramming" for new situations. Even though a child may know what he is supposed to do, he may be unable to master his actions because of genuine neurological inability to alter his response patterns to verbal commands that are yet complicated to him (Pontius, 1972).

Pontius suggests that this neurological inability to accommodate quickly if at all to unaccumstomed circumstances normally exists up to four years of age, and for some children even longer. It could be much easier for the child in a preschool situation, for instance, if a familiar person were available to interpret the situation for him. Pontius finds here a basis for later behavior, e.g. some juvenile delinquents who under certain stressful conditions cannot act according to what they know they should do.

As long ago as 1931 Alexander and Staub were concerned with the early identification of behavior that might result in later delinquency. They referred to all children as potential delinquents if appropriate later socialization did not take place. Sometime between the ages of 4 and 6, they pointed out, normal children begin to repress their non-social tendencies, and transform them into socially acceptable behavior by the time they reach puberty.

Many years later Glueck and Glueck (1950, 1968, 1974) have reported a study of 500 delinquents who, in retrospect, were found to be slightly over 8 years of age on the average when maladaptive behavior was first apparent. Some had shown signs of delinquency even earlier in the first and second grades. The Gluecks (1950) speak of "the child's first attempts to adjust to the codes and authority imposed by adults outside the home" as "the acid test of his social adaptability." If a child faces this test with amorphous values or before he is developmentally able to handle the testing of the self, the consequences could be disastrous.

No doubt delinquency implies complex behavior, and there is no easy way to completely account for or predict it. It seems clear that children who fail to absorb and eventually internalize meaningful values and self-worth during their early childhood years are candidates for delinquency.

Values, self and society. For most western children the time inevitably comes when a child must learn to adapt to the world outside the familiar boundaries of home and its immediate neighborhood. This may be an experience of eager exploration or of threatening anxiety, depending on the child's ability to meet the situation. If he is ready for it, his positive sense of self-worth will expand as he accepts other people and embarks on a creative social adventure that will be surprisingly stable in the years to come. If he is not ready, he enters the larger social group with a personal identity handicap which is likely to remain with him throughout his future struggles to find and maintain his place in society.

Northway (1968) discovered that the sociometric status of children in nursery school and kindergarten corresponded very significantly to their sociometric status several years later in grade 5. There was some growth with increase in age, but the relative level of social status among peers was largely unchanged from nursery school through elementary school. Felker's studies (1974), as noted early in the previous chapter, largely confirm Northway's findings.

Since values and a positive self-concept are originally acquired in relation to significant, positive adults, it is natural that in new and changing environments a child will find initial security by relating to the available adults--the authority figures who control his environment, as, for example, foster parents, teachers, bus drivers and recreational personnel. A child who has matured enough to learn that he is a competent, worthwhile person is not threatened by these adults. He is not essentially dependent on their approval. His experience is merely extended and his understanding enlarged by learning to know new people and places and methods. He is better able to put new authority figures in perspective and he can meet the acid test of adaptability.

But for some children, adults in authority pose a threat. Formaneck and Woog (1971) examined the perceptions of authority figures (father, policeman, teacher) held by preschool and elementary school children. They found that the preschool children are considerably more threatened by authority than the elementary school children. Authority figures tend also to be a greater threat to children of lower socioeconomic status. Teachers in particular are a greater threat to boys than to girls.

Punitive teachers exert a negative influence in general on first graders not yet completely sure of themselves and their values (Kounin and Gump, 1961). First-grade children who have punitive teachers tend to be unsettled in conduct and less trustful of school, less concerned with school-unique values.

Even as late as the sixth grade, children's self-esteem has been found to be affected by a teacher's appraisal of the child as revealed in teacher-assigned grades (Frerichs, 1971). This effect may extend into adolescence or later if a positive self-concept had not been already established and if grades are considered to be an evidence of the teacher's evaluation of one's worth rather than an index of individual achievement. The child who has a high sense of self-worth is more likely to feel free to function independently of teachers' assessments.

Eventually, of course, the self with its component values will be tested within the child's peer group. Where learning in the early childhood home environment has provided adequate ego-strength, the peer group experience will usually be positive--moving toward the development of a strong, autonomous moral character. Children without the benefits of an optimum early home background, and therefore children without strongly internalized values and standards, may be vulnerable to peer pressures (Devereau, 1970).

Association with the peer group by its very nature gives children the opportunity to see themselves in relation to others of their age. If self-esteem is high, they can examine differences between themselves and others objectively and independently. They can afford to be different because they sense their own worth. But when an adequate sense of self-worth has not been developed, early association with a peer group seems to demand that individual characteristics be submerged in order to maintain self-esteem, and a desirable independence is sacrificed, possibly for life.

It has been assumed on the basis of conclusions by Ausubel and Ausubel (1963), Crovetto, Fischer and Boudreaux (1967), and Hawk (1967) that disadvantaged children are likely to have a low self-esteem. But Soares and Soares (1969) found higher self-perception scores among the disadvantaged in a study of public school children in a New England city. A similar study with a larger sample over a wider age-range (Soares and Soares, 1970-71) gave the same results--the self-concepts of disadvantaged children were higher than those of the advantaged. The emotional climate of the family may be more important than economic or social influences. If the climate is negative it appears that low self-esteem can exist in either advantaged or disadvantaged families.

Trowbridge (1969, 1970, 1972) reported much the same evidence as Soares and Soares and like the Soares, examined children of about 9 to 14 years of age. Again children from low socioeconomic groups showed higher self-concepts than more advantaged children. He also noted that rural and small-town children scored higher than urban children (Trowbridge, 1972).

Yet studies by Lamb et al., (1965) and Crovetto, Fischer and Boudreaux (1967) found lower self-concepts for lower socioeconomic level children, except for those who were able to raise their self-concept as they learned to perceive themselves similar to others. But there was one clear distinction: the Soares and Trowbridge studies examined children of about 9 to 14 years, while the Lamb and Crovetto, et al. studies centered on preschoolers.

Radke, Trager, and Davis (1949) noted a sensitiveness in preschool and young schoolchildren toward membership in particular social groups. The awareness that they were not like everybody else also affected their self-concepts. What appeared to be a low self-concept among these children seemed to be associated with their inability to cope with an environment different from that to which they were accustomed.

Age or maturity, satisfying experiences and desirable cultural variables all nurture the development of the positive self-concept a child needs as he prepares to function constructively in the larger society. Analyses of early childhood literature seem to point squarely to the need for developing in the young the values and self-worth necessary for social competence. Yet the traditional "system" for this job--early socialization in the family context--is being widely questioned.

In some respects children are "socializing each other," gaining their values and sense of worth randomly from ever younger and more insecure peer groups. Spitalny (1957) speaks of children as mirrors for each other. This could provide a positive experience in personal growth if the child's own sense of self were securely rooted in a stable family group. But very young children whose own value system has not yet become grounded and stabilized have little basis for assessing the behavior of their peers, many of whom they choose as their examples. This is illustrated by a study of preschool children's leniency toward cheating in which rule breakers became more lenient toward misdemeanors while conforming children became more severe (Ross & Ross, 1969).

Considering the likelihood that young children are unable to reason consistently until they are at least 7 to 11 or older (see Piaget, 1952; Phillips, 1969, and others in Chapter 8), it should not be surprising that there is a risk in turning them out of the singular security of the home before those ages. For example, place a 4- or 5-year-old, his values yet unstabilized, in a preschool. He soon finds that the behavior of his peers differs from that which he has been taught at home. Having not yet developed a desirable independence, he readily adapts to his peers, and soon his parents are shocked with his aberrational behavior--his "bad" language, dietary preferences, or willingness to cheat or steal. But their well-reasoned remonstrances are not necessarily accepted by the child for he is not yet reason-able. He is guided more by emotional influences than high cognitive perception. This also gives substance to Bronfenbrenner's (1970) conclusion that little children are not carriers of sound social and moral values.

Disturbing questions indeed emerge from a reasonably objective analysis of the literature concerning values and the child's self-concept. These questions centering chiefly around the socializing agents of children, suggest grave implications for the future of society. How do children best acquire the values and positive self-esteem necessary for constructive growth? Are present socializing agents competent to give children what they need? If not, what changes does society need to make to insure for its children a worthy sense of self upon which they can base learning for constructive citizenship?

# CHAPTER IV

# THE LEARNING ENVIRONMENT

Synopsis. Learning in early childhood is largely dependent on the people and things in a child's immediate environment, and the opportunities he has to respond to them. Among the factors contributing to an effective learning experience: personal approval and acceptance of his behavior by adults; active self-initiated, leisurely exploration and discovery of a healthy, predictable environment adapted to the child's culture; active manipulation of the materials in his immediate world; active interest in a learning task; less constant exposure to external stimulation rather than more.

These factors inhibit early learning: disapproval; fear; uncertainty; confusion in the surroundings or in relation to authority figures such as parents, other adults in the home, older siblings, and teachers; passive absorption of continual sensory stimulation--TV, etc.; structured learning with its tedious repetition and boredom. Verbal stimulation does not appear to be as necessary for the development of early learning as has been supposed.

The quality of the home and family rather than a particular culture or socioeconomic level, or materially enriched environment, seems to be the most significant factor in cognitive and perceptual development. It is not so much the school environment that enables a child to learn in his early years, as what he brings to the school. For children who are insecure, socio-emotionally dependent or disadvantaged in other ways, a structured situation will sometimes foster learning, but the internal security of a stable home and family which permits learning without deliberate structure generally fosters greater progress.

Cultural and social class differences in experience and modes of thinking lead to differences in learning processes which often make some children appear disadvantaged whether they are or not. Measuring learning progress by imposed standards, rather than the children's actual ability to achieve, may mean automatic disadvantage for ethnic and minority groups. All children deserve the privilege of developing and learning in an optimum environment, but this does not necessarily suggest a contrived learning situation. The crucial characteristics of a positive atmosphere for early learning are found in virtually all cultures and societies; usually they are best provided by parents and the home.

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The extent and meaning of learnings in early childhood are largely dependent on the people and things in a child's immediate environment. Much of the recent agitation about early learning is concerned with environmental deficits, especially among the poor and minority groups (Cole & Bruner, 1972). There is reason to believe that, as vital as are the needs of these disadvantaged, they have received a disproportionately heavy emphasis both in research and in policy making. Thus certain therapies for the deprived have often been generalized to apply to all children, much like prescribing aspirin for all because a few have headaches. Learning competence which is assessed only or primarily from the observed performance of individuals within any group is, as Cole and Bruner also state, "both situation-blind and culture-blind." Therefore our concern here is to study all groups systematically, whether socioeconomic levels or advantaged or disadvantaged, in order to derive objective judgments.

Learning, of course, can proceed under a variety of circumstances depending on the specific categorization of experiences within a culture (Tyler, 1970). So any attempt to describe an ideal learning environment must be made within an appropriate cultural framework. In the United States, deficient environments are often assumed to be a factor, even the principal factor, when groups of young children do not measure up to the learning standards of middle-class children (Holmes & Holmes, 1966; Gill, Herdtner & Lough, 1968; Ball, 1970; Jordan, 1971; Stevenson, Williams & Coleman, 1971). But Cole and Bruner (1972) suggest that this may be a highly suspect criterion. They suggest that the organizational adequacy of any environment depends on whose point of view is used in categorizing familiar areas of experience.

On the other hand, studies of both animals (Denenberg, 1969; Weininger, 1956; Rosenzweig, Bennett & Diamond, 1972) and human infants (Honzik, 1967; Heber & Garber, 1970) indicate that some environmental factors do have an influence on basic learning achievement. These factors must be identified and, insofar as possible, be incorporated into a child's environment if learning competence is expected. Nor is this necessarily inconsistent with the Cole and Bruner thesis.

An atmosphere for learning. A number of assumptions can safely be made regarding basic learning: It involves a child's experience with his immediate surroundings (Caldwell, 1972). It includes information about the people and things that affect him and to which he has opportunity to respond. This acquiring and ordering of information encompasses the affective, social and cognitive aspects of a child's development (Shapiro and Biber, 1972). It is an integral part of personal and interpersonal growth in self-esteem, sense of identity and orientation to other people.

How personal approval contributes to an effective learning experience is illustrated by the responses of 5-and 6-year-old disadvantaged children to rewards for learning. In Farber's (1970) study some children were rewarded for correct responses with candy and others with a verbal "Good, that's right." Those who received personal recognition instead of candy not only showed superior learning but also learned with fewer trials.

Unfortunately, however, adults do not always appreciate the value of approval expressed in such a personal way. So they often ignore it. Teachers frequently imply disapproval of a valuable cultural heritage by expecting or even requiring children to perform according to standards that are inconsistent with this heritage. These *differences* then become *deprivations* (Cole & Bruner, 1972) when they might well have been learning assets. When elementary school teachers' attitudes toward child behavior were compared with those of clinical psychologists (Tolor, Scarpetti & Lane, 1967) it was found that the psychologists are more accepting and tolerant than the teachers. Generally the more experienced teachers, however, are closer to the psychologists in their assessments. A variety of child behaviors considered normal by psychologists are often termed pathological by inexperienced teachers. Teachers generally tended to regard almost all differentiating behavior as abnormal.

It should not be surprising that learning becomes inhibited in an atmosphere of disapproval. A study of teachers' belief systems (Harvey et al., 1966) showed that teachers who were most willing to accept differences in a positive manner and who could interpret situations from a broad point of view were clearly superior in producing educationally desirable atmospheres. However, teachers who frequently expressed platitudes and normative beliefs, who could see things only in their way or who were otherwise inflexible, were much less successful in creating positive learning environments.

To become a competent individual a child must learn to deal effectively with his surroundings (Shapiro & Biber, 1972). But this is difficult if not impossible when he must cope with fear, uncertainty and confusion (Scarfe, 1972). A child from an unstable home or from unstable segments of society is particularly susceptible. For example, Klaus and Gray (1968) identified a confused noise background as a hindrance to learning among some disadvantaged children. Such children have more difficulty concentrating and are more easily distracted in a learning situation (Conners, Schuette & Goldman, 1967). Conners and his colleagues noted that this distractibility appeared more likely among 5- and 6-year-olds than among those from 9 to 12.

Confusion may also exist relative to authority figures whether those figures be parents, other adults in the household, older siblings, or teachers. When there is competition for a child's attention (Abramson, 1973) or excessive child interaction with a number of adults (Tulkin & Kagan, 1972), a child can become confused if authority is not clearly designated. Abramson observed negative aggression effects while Tulkin and Kagan found a limitation of opportunities to explore and to manipulate the environment. "Paradoxically," says Bronfenbrenner (1970) of the preschool child, "the more people there are around, the fewer the opportunities for meaningful contact." This has important implications for any kind of institutional experience for very young children, but particularly for those kindergartens or care centers where continuity of care is not assured and where adult-child ratios range higher than about 1:5 (Moore, Kordenbrock & Moore, 1976).

When confusion of adult authority and/or values is minimized or eliminated, adults can more readily provide an assurance that makes it possible for a child to explore and organize his own environment. Collard (1971) found that lower and middle SES children explored about equally, although middle-class children seemed to have more opportunities for experiences around which to organize their discoveries. Collard also observed babies reared in an institution with one adult caregiver for every five babies. These babies gave evidence of insufficient adult attention and had less inclination to explore and fewer schemas for playing with a toy than the home-reared babies.

Honig, Caldwell and Tannenbaum (1970) observed that adults in a child's environment are of "overwhelming importance" for cognitive input, especially during the first four years of life. Even when children were surrounded by other children, they sought out an adult for informational transactions. A conclusion of this study was that any environment is deficient for learning if a child does not have easy--and friendly--access to an adult for information exchange.

Acceptance, approval, and assurance born of a highly-predictable environment all contribute to a positive atmosphere for learning. To these must be added as much freedom as is safely possible to explore the environment with whatever interest and challenge it offers. The animal study by Rosenzweig, Bennett and Diamond (1972) even implies greater enrichment in brain development when there is larger freedom to explore, particularly in a natural setting.

The freedom to manipulate actively the materials in a child's immediate world helps him to develop a specific, concrete base for learning. Here appears to be a key influence in determining whether or not he will become deprived. Here also lies a poverty not often realized among low SES families--the poverty of freedom to manipulate and to explore. In comparing economically advantaged and economically disadvantaged 5-year-olds, Kunz and Moyer (1969) found no relationship between the respective environments and children's physical skills, their attempts at problem solving or the length of sentences spoken in their vocabularies. But the disadvantaged children showed a lack of experience with manipulative materials along with a difference in vocabulary and motor skills.

A relationship was also observed between manipulation of materials and learning, by Wolff, Levin, and Llongobardi (1974). Kindergartners were tested who either produced or observed interactions between pairs of toys. Twenty-four hours later the children who had actively manipulated the toys again paired significantly more items than those who had only observed.

This freedom to explore, to move and to manipulate helps children to learn not only about material things but also about themselves. Carpenter and Shipley (1962) describe it as an intellectual and emotional as well as physical experience. Freedom to explore encourages curiosity which leads to new encounters with both people and things, affording an ever-widening challenge for learning.

The extent to which a child is interested in a learning task may have much to do with his performance as a learner. Marshall (1969) found that when children who had a poor educational environment, as determined by their area of residence and the education of their parents, were assigned a high interest, game-like task they learned as quickly as children from better educational environments. Marshall also observed that children from high-rated environments performed better without the game-like qualities that added the interest to the task. He concluded that these game-indulged children could complete a dull task simply to get it over with. For them task interest needed to be inherent in the task itself.

The quality of motivation appears to be a transcending factor here. The "fun and games" conjured up to make learning appealing are apparently highly extrinsic--pseudo-components of the atmosphere of learning, gimmicks that stimulate at the outset but soon pall. These bored, over-stimulated youngsters, their intrinsic motivation cooled, eventually often become passive acquirers of information.

Furthermore, any passive learning should be carefully appraised before using it to strengthen a child's motivation or build his creativity toward positive, constructive ends. Using videotapes that depicted and promoted social integration of black and white children, Colton (1972) found that kindergarten children from both integrated and all-white schools gained a significant number of concepts from viewing the tapes. But the passive viewing resulted in almost no active changes in social preferences relating to those of an opposite color.

This general principle has serious implications for learning in general, and particularly for young children yet in their formative years. There is evidence that passive absorption of continual sensory stimulation actually reduces the arousal level and dulls responses (Jeffery, 1969). Brackbill (1973) found this to be true whether the stimulant was audio, visual, tactile or temperature. But perhaps more startling, she determined that this reduced arousal remains relatively unchanged over time, not for just a few hours but for years. This dulling effect, however, was not apparent with intermittent stimulation.

In a technological culture children are often surrounded by mechanical noise and clamor. Motion pictures and television intrude their visual stimulation of light and movement, as well as sound. The findings of both Colton and Brackbill suggest that the real need for an optimal learning environment of many children is for less constant exposure to external stimulation rather than more. In the early development of intelligence, the quality of over-stimulation in the environment may be more detrimental than under-stimulation (Wachs, et al., 1967). The alternative to contrived stimulation would appear to be active, self-initiated exploration and discovery of a reasonably predictable environment (Carpenter & Shipley, 1962; Rosenzweig, Bennett & Diamond, 1972). Gesell and Ilg (1943) in fact suggested that nature herself offered children great teaching, especially when allowed to do so without adult interference.

Thoughtful critics of early schooling (Elkind, 1970; Robinson, 1973; Rohwer, 1971, 1973, 1975) suggest that a child's opportunity to explore his environment at leisure is being jeopardized by measures that were meant to counteract environmental deficits. Paradoxically, it appears that the very laborious methods employed to inveigle children into learning often instead lead to their passivity and wearied boredom--as already inferred by Marshall (1969), Colton (1972), and Brackbill (1973).

The very redundancy in structured learning, the tedious repetition year after year of the same or similar school materials might very well inhibit a child's intellectual freedom to move and explore. And according to Carpenter and Shipley (1962) this could actually hold up learning. This is especially unfortunate for those children who have reasonably warm and consistent homes, and who if they waited until they are academically ready, could quickly learn the same skills without boredom and unnecessary repetition. There are indications that much current preschool or kindergarten stimulation in early childhood is, to use a metaphor from Ames and Chase (1974), a two-dimensional effort to force what should happen spontaneously in the natural three-dimensional world of the home.

Even verbal stimulation, so often considered fundamental to early learning, may not be as necessary as has been supposed for the development of basic learning ability. Cole and Bruner (1972) define verbal skills as "cultural amplifiers," useful for adapting to a culture. But there is apparently no real support for the assumed role of a specific language in the development of cognition. In other words, a child's intellectual ability may in no way be impaired merely because he does not communicate in the commonly used language or according to a prescribed pattern (Dennis, 1942; Havighurst, Gunther and Pratt, 1946; Vernon, 1965; Hooper, 1969; Rohwer et al., 1971).

The material environment. Although a learning environment may be materially limited, highly intelligent children may come from low SES families. It is not their being materially poor that limits learning but the apathy, the lack of initiative that sometimes accompanies poverty. As we have already inferred, initiative and achievement are not the prerogative of wealth nor of a particular culture. Families can provide a challenge for learning in quite diverse environments. Vernon (1965) concluded from a study of Jamaican, Eskimo and Indian boys that, in spite of linguistic handicaps, some of these children actually scored very well on tests of verbal intelligence and achievement. Vernon's results indicated that the most significant single influence in these various cultures was the quality of the home and family.

While active exploration and manipulation of materials is quite obviously essential for early learning, enriched environments alone do not necessarily improve cognitive and perceptual development (Busse et al., 1972). When six experimental preschool classrooms were provided with special equipment to facilitate learning, the enrichment did significantly alter the classroom environment. Yet there were no differences in verbal ability or auditory perception between the enriched children and six groups of children from ordinary classrooms. In fact, the control children showed greater gains in visual perception and ability to perform intellectually. While enriched children came out ahead in visual sequential memory, they were surpassed by the controls in all other areas.

Busse and his colleagues concluded that (1) a "properly" equipped preschool was not a panacea for the problems of disadvantaged children, and (2) there can apparently be too much of a good thing. The greatest gains made by preschool children occurred without special equipment. This suggests that a simple, natural environment may be the optimum place for learning during the early years.

The same principles that govern learning in relation to structure and stimulation in the environment are also apparent in the effects of urban and rural settings. Children 7 to 9 years old from a farm community in Norway were found by Hollos and Cowan (1973) to do as well or better than village and town children on tests of logical operations, and their performance became markedly better with age. The 7-year-olds in this study were still preschoolers because of later school entrance age laws in Norway, yet this did not hinder their performance.

Although these Norwegian farm children were considered socially isolated and were limited in role-taking abilities, their general intellectual development had not been hindered. It was suggested that differences in ethics and values between the farm children and the other groups of children influenced their performance. Whatever the reason, language stimulation and schooling did not seem to play a major role in developing logical operations ability in the children.

This clearly raises a question of whether or not a school or other institution with a more socially-structured environment with material advantages is a viable alternative for the ethics and values of a reasonably good home, in providing sound learning experiences. There has been relatively little empirical research on the incorporation of family value systems into children's thinking. Yet Hollos and Cowan's (1973) evidence suggests that children tend to make greater progress in learning if they come from homes which have clearly delineated value systems. This is a promising area for the objective student.

Studies dealing more specifically with the effects of schooling or lack of schooling on children's ability to learn usually produce similar results. They generally conclude that it is not so much the school environment that enables a child to learn in his early years, but what he brings to the school. And if there is no school, he can still develop the ability to learn (Sigel & Mermelstein, 1965; Vernon, 1965; Goodnow & Bethon, 1966; Mermelstein & Shulman, 1967; Goodnow, 1968). The evidence from these studies suggests that emphasis on attempts to structure an environment for learning is of lesser value than the internal motivation which originates with the child's earliest consciousness of his family, home and the immediate cultural milieu.

The meaning of culture for productive school learning appears to be generally underestimated. Weininger (1975b) urges that educators develop learning environments for children based on various cultures. In the classroom there must be a transitional period, a bridge, fashioned for the child in which he makes use of experiences that he has had at home and which his culture has made possible, so that he does not enter school feeling alienated and valueless. Educators need to study and understand the environments from which children come. They should then adapt familiar learning environments so that children can build on whatever knowledge and backgrounds they have acquired from their homes and the cultural assets they offer.

The home environment. As a place for early childhood learning, particularly for developing language and social skills, the home and neighborhood have been found to be as effective as carefully planned preschool experience. Vance (1967) reported such results from a comparison of two groups of preschool children. Children in a preschool program designed to improve the language and social skills of disadvantaged 3- and 4-year-olds had gained no more at the end of a seven-month period than children in a matched group of preschoolers who had remained at home. In another program low-income black mothers participated in activities at home with their own preschoolers (Greathouse, 1972). The results of this program indicated that more teaching and learning can occur in the home than had previously been assumed.

The earliest tactual, auditory and visual stimulation results in learning. According to the findings of a longitudinal study on the effects of the environment on mental growth (Honzik, 1967), this early sensory stimulation is best provided by the home and family. This agrees with the conclusion of Collard (1971) that home-reared infants received the greatest variety of stimulation from their environment through social responses within the family.

Holmes and Holmes (1966) also reached the conclusion that the home environment could have a significant influence on the learning of preschoolers. In a Head Start-related study, children who consistently gave the highest evidence of learning were likely to have favorable home environments and parents who were interested in their development. The highest scores were made by middle SES children who were not even participants in the school program. Head Start children with concerned parents scored next highest. Children who were sought out by Head Start personnel but whose parents were not especially interested made the lowest scores, regardless of extent of participation in the program. Holmes and Holmes suggested that family environments constituted the differentiating factor among these children. Parental concern was a greater influence than the specific provisions of the material environment.

Similar results have been reported in work with elementary school children. Wolf (1964) examined relationships between the home environment and the general intelligence test scores of urban, suburban and rural children who averaged about 11 years old. As with the younger children, the home environment proved to be positively and significantly related to intelligence scores. The better the home, the more stability and interest it provides, the easier it is for children to learn, while disorganized and threatening homes tend to inhibit intellectual development.

When children from kindergarten through grade 6, mostly black and from low-income families, received learning support at home they were able to achieve at a higher level in school (Smith, Mildred B., 1968). This home support included creating a climate conducive to study. Parents read aloud to their children to stimulate interest in reading. And just having books and newspapers around and available was found to be supportive. Smith suggested that educators should be helping parents to assume these responsibilities for their children's education rather than expecting the school to take over the parents' roles. It was apparent that the school could not make up for what the home did not provide.

While children seem to learn best when they can relate to a warm, responsive adult, Blank and Solomon (1969) found that mere personal involvement on the part of a nursery school teacher was not sufficient to produce significant cognitive change in the disadvantaged child. Even when a teacher worked with a child on a one-to-one basis, learning from a cognitive point of view was not successful, particularly for the low SES child, without a structured teaching situation along with the teacher involvement. This at first seems to contradict studies showing the advantages of relatively unstructured environments. But in reality it is entirely consistent. It is the security of a healthy early attachment to a reasonably consistent adult that contributes to later emotional independence (Yarrow, 1972). For children who are insecure and socio-emotionally dependent (Gewirtz, 1972b), the structured situation described by Blank and Solomon provides an external security that fosters learning. But greater progress is fostered by that internal security of home and family which permits learning without deliberate structure (Holmes & Holmes, 1966).

Blank and Solomon also noted that in middle-class homes, opportunities for adult-child verbal interchange came about normally and were not generally limited to short, set times. In lower-income homes, these opportunities were less common, even rare in some homes, and the relatively brief time spent with a teacher was not a satisfactory alternative. This lack of parental responsiveness in the home was identified as a primary cause of these children's difficulties in verbal skills and attention span, and maximum use of the time a child had with his teacher was deemed essential.

Disadvantaged children must not be sold short. They do have the potential to learn (Hooper, 1969; Rohwer et al., 1971), and the fostering of this potential can be done by concentrating either (1) on a structured teaching environment for a certain time each day (Blank & Solomon, 1969), or (2) on a supportive home environment (Holmes & Holmes, 1966) or a combination of these efforts. For early childhood learning the structured teaching environment has limitations (Busse et al., 1972; Carpenter and Shipley, 1962). But many homes are so lacking in supportive qualities that they depress the children's morale and hinder learning achievements (Secord, 1967).

Litman (1969) discovered limited resources in both low and middle SES families. And she found that well-developed children could come from either crowded or spacious homes. It was the quality of the home that mattered most. Home environments that provide such opportunities as conversation among family members and reading by adults to the children (Jones, 1972) or simple materials and toys to manipulate (Levenstein & Levenstein, 1971; Greathouse, 1972) appear to provide more effective learning opportunities than do the schools.

Influences of culture and society. Secord (1967) concluded that the types of experience available to a child are determined by the culture in which he lives. Accordingly, he develops his attitudes and ambitions. Horowitz and Resenfeld (1966) found that persistent behaviorial deficiencies were often reversible in children whose experience had been primarily limited by social conditions.

Culturally-determined differences in experience and modes of thinking lead to differences in learning processes that make some children appear at a disadvantage whether they are or not. As noted earlier, teachers sometimes appraise and condemn as a handicap a cultural "peculiarity" which could have been turned into a distinct asset. Stevenson, Williams and Coleman (1971) raise questions about such comparisons based on average levels of performance among populations. They suggest that a more revealing approach would be comparing patterns of correlations among different learning tasks.

The ability to profit from previous experience and to recall previous learning was found by Rohwer et al. (1971) to be about equal for two remarkably different groups--white children from a high socioeconomic level and black children from a low socioeconomic level. Variance in learning success for both groups was attributed to the manner in which learning materials were presented. When materials are relevant and meaningful and when they are presented in a way that can be understood (Stevenson, Williams & Coleman, 1971), learning can occur at all social levels (Pishkin & Willis, 1974).

A positive attitude toward school has also been demonstrated to be an asset for learning. Neale and Proshek (1967) found this was not necessarily a problem limited primarily to culturally deprived children, as some have assumed. Fourth to sixth graders from a culturally disadvantaged area placed a high value on school although they considered it something difficult to attain. Socioeconomic standing is of less consequence than is usually assumed in determining attitudes toward school, at least in the United States (Berk, Rose & Stewart, 1970).

The cumulative results of these studies indicate that attitudes, maturity, purpose and appropriate process are the key contributors to learning success. When due consideration is given to these factors, children from supposedly deprived conditions seem to show an ability to learn which is in no way inferior to that of normal American children (Dennis, 1942; Havighurst, Gunther & Pratt, 1946; Vernon, 1967; Hooper, 1969; Weber, 1971).

Learning and cultural imposition. The foregoing studies relating to the learning environment bring into perspective two distinct aspects of the problem: First, the basic conditions that permit or encourage learning to occur, and second, the social and ethnic group differences which assist in organizing experience and mind-hand relationships.

Cole and Bruner (1972) suggest that research involving cultural differences is of little practical benefit as long as one cultural system is assumed superior over another. When children of one social group seem to learn less readily than others, the source of the learning difficulty needs to be identified. It may be in the home environment (Holmes & Holmes, 1966; Klaus & Gray, 1968; Tulkin & Kagan, 1972), but it may also arise from the unrealistic expectations of teachers as suggested earlier, who assess performance from a cultural point of view foreign to that of the child (Harvey et al., 1966; Tolor, Scarpetti & Lane, 1967).

It has been observed that social class differences in children's intellectual performance appear sometime around the age of 3 (Golden et al., 1969; Jordan, 1971; Robinson & Robinson, 1971), and Golden et al. (1969) suggested abstract knowledge along with verbal interaction as factors significantly differentiating social classes during the third year of life. Robinson and Robinson identified the development of verbal abilities between the ages of 2 and 4. These studies point to the possible conclusion that it may not be the child's ability to learn, i.e. to assimilate knowledge, that is impaired, but rather his ability to organize and communicate patterns of thought and behavior.

Wiener, Rider and Oppel (1963) found evidence of declining IQ scores among lower SES children which suggested emotional disturbances occurred after the age of 3. This can be especially true if a child sees little meaning in what he is asked to do. When low socioeconomic black children were compared with low socioeconomic white children on basic learning ability, the black children were more content merely to guess at answers. Their attitudes were thought to be a possible reason for their failure to take advantage of a training session (Guinagh, 1971).

Another difference between social classes was found in perceptual abilities: The poor performance of disadvantaged first graders when compared with children from average-income families was found to be "shocking" by Gill, Herdtner and Lough (1968). Yet they noted that the disadvantaged showed comparatively greater ability on visual-motor tasks.

Radin (1967) concluded that skills and attitudes that were incompatible with middle-class values demanded intervention in early childhood so that disadvantaged children could measure up to generally acceptable academic achievement. But Rist (1970) reported that public education practices were not accomplishing this objective. Instead, a child's early performance usually dictated his future position in the class, thus perpetuating class barriers by a relatively immobile stratification established at the kindergarten level. Measuring learning progress in terms of imposed standards rather than the children's actual ability to achieve may mean an automatic disadvantage for ethnic and minority groups.

Where the immediate school environment is lacking in those essentials that create an atmosphere conducive to learning, every effort should of course be made to correct the deficits.* Often learnings and skills may be transferred from a minority group culture to a dominant culture with profit to both (Cole & Bruner, 1972). Culture-related forms of behavior need to be optimally recognized and utilized in educating minority and ethnic groups (Baratz & Baratz, 1970). Baratz and Baratz suggest that research efforts should seek to discover the different or distinctive cultural assets, rather than the pathological forms, of minority group behavior. When differences are not recognized, subcultures may be pressured to conform to the dominant culture. And pressures toward conformity will leave some individuals deprived in areas of self-expression and creativity (Richmond & Norton, 1973).

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*See Chapter 13 for one suggested list of qualities and characteristics of optimal preschool or care centers (Moore, Wong, Moore, 1976).

All children deserve the privilege of developing and learning in an environment that promotes physical, mental and emotional health. But this need not demand a contrived learning situation. Acceptance, approval, assurance and freedom to explore an environment that presents an appropriate challenge--these appear to be the crucial characteristics of a positive atmosphere for learning. These have been found in all cultures--rich or poor, complex or primitive, educated or largely illiterate. And usually they are best provided by parents and home.

# CHAPTER V

# NEUROPHYSIOLOGY: DEVELOPMENT OF THE BRAIN AND LEARNING

Synopsis. Even with much research over the past 50 years, relatively little is known about the development and function of the central nervous system (CNS). Learning must not be confused with physiological development; nevertheless, some things helpful to the educator are known and can be stated clearly regarding the human brain.

The CNS is not structured to mature as a single unit or organ but rather as a complex interworking of many highly sophisticated lesser elements, each separate functional area having its own timing and sequence of development. Furthermore, and importantly, the functioning of the human brain progresses on a similar basis as its structure. Yet the sheer limitations of brain research suggest caution, as for example, in relating increases in brain weight to increased mental capacity and relating other brain development sequences, such as the progression of myelination, to learning and education.

At birth the brain is about one-quarter of the adult weight and possesses virtually all its brain cells and all major brain regions. By six months, its weight has doubled, but hereafter growth slows down and from 2 years until adolescence it is relatively uniform. The posterior area (visual-sensory function) appears more developed than the anterior area (emotional and cognitive functions) but after age 2 the frontal lobe accelerates in its growth and by age 6 is equal in area to that of an adult. The brain continues to grow in mass until 25 years of age but the maturation of the nervous system is not necessarily uniform in all its parts throughout this growth period.

The maturation of the central nervous system at the cellular level is not clearly understood. The motor system develops first, followed by the sensory system, but the precise controlling mechanisms of developmental sequence are not known. There is similar progression in the bioelectrical activity of the brain. Functional capabilities are staggered along the time maturation lines of development. Thus the anatomic state of maturation dictates in part the emergence of brain function. Studies relating to development of brain bioelectrical activity are important because they provide significant correlates with brain maturation and behavioral development.

Specific developmental differences are noticeable between the varying conscious states of the child and the adult. It is known that at about the ninth year the EEG record in the posterior brain region is essentially like that of an adult, at about the fourteenth year in the frontal region and after 19 years in all cortical areas.

Yet more longitudinal studies involving electrical patterns in developing children are obviously needed.

It is often suggested that simple reflexes provide the behavioral substrate for all of our activities. This is simplistic, to say the least. The orderliness and careful time sequences during neural development together with complex biochemical influences produce an immensely complex brain capable of diverse actions throughout the body.

The duration of neural development is variable. Often it does not appear to proceed in a smooth fashion. Eventually neural linkage occurs between the major brain systems and once maturation of the neurons is complete, brain "plasticity" emerges. Learning is one aspect of this so-called plasticity. But only a little is yet known about the brain mechanisms involved in learning or memory storage. It is possible that the brain is more modifiable by environmental conditions than previously thought and there is considerable evidence that the effects of learning can last a long time. There is doubt, however, that learning can occur without motivation and reward. And in brain development it is difficult to separate the nature and extent of genetic control from behavioral-cultural overlap.

Based upon the neurobiological framework of brain development as presently known it would be wrong to establish some precise cut-off point that defined the brain as fit or unfit for learning.

We are only at the threshold of the process of understanding brain growth and maturation. Yet it is apparent from both educational studies on how children learn and from our understanding of the maturation of the brain that improved technology may not necessarily improve or accelerate intellectual growth. First, the child must achieve appropriate maturation of the brain.

Since CNS structure and function move along pretty much together, it is tempting to guess at developmental ratios between brain development and academic educability of the child. But research is not yet ready to verify this conclusion. However, there is sufficient data available to suggest caution in mandating academic or academic-readiness schooling for young children under 8 years of age.

There are qualitative breaks in the unfolding of intelligence and conscious experience. From our current understanding of brain development these follow the growing capacity to process simultaneously multi-sensory information.

Replicable research evidence does suggest that this is not fully accomplished until about 8 to 10 years of age or even later (see Chapter 6).

Few intellectual problems we face are as important as understanding the human brain. Some consider it the ultimate scientific challenge confronting mankind (Eccles, 1974). Although there are many remarkable treatment forms for behavioral distortions and defects and malfunctions by the brain, we still face many unknowns in our knowledge about this incredibly complex base of our central nervous system.

As the neurosciences expand the horizon, many problems are solved but many more questions press forward on this, one of the last of all intellectual frontiers. New scientific approaches and disciplines emerge to challenge these questions and the neurosciences have shown vigorous growth in the last hundred years. Despite this growth, the origin of the nervous system and each developing sequence is played as a dramatic mystery against only our beginning comprehension. The influences that promote the wiring and interactions of brain cells during the span of life are established beyond our direct observations. Research provides a glance or a small window to view these events. But many times the investigations must be conducted on other species than man and the results tentatively related to what we know about our own capabilities for brain performance.

Neurophysiologist Paul Yakovlev concurs with psychologist Jean Piaget in stating that "learning should not be confused with development." Development to them is a universal property to all species, whereas learning is a "species specific, yet highly individual, particular function, which is in constant change and evolution . . ." (Yakovlev, 1972).

He also agrees with other neuroscience specialists (neurophysiology, neurochemistry, neuropathology, neuropsychology, etc.) in saying that the state of the art allows only the most limited extrapolation from neurophysiological research to education and related behavior. Says Yakovlev, "In all due candor, I would caution against transposing the terms and definitions of biomorphological research into the plane of pedagogical and psychological concepts and definitions" (Yakovlev, 1972).

On the other hand, there are some things we do know and can state clearly regarding the human brain--much of it taken from experimental research on humans and much from those animals which have characteristics similar to specific human structure and/or functioning.

Neurophysiologists appear reasonably certain that the human brain is not structured to mature as a single unit or organ but rather as a complex interworking of many highly sophisticated lesser elements, each separate area of functioning having its own timing and sequence of development. With this sequence progresses the overall maturation from conception throughout life. Yakovlev says that it has "an arbitrary 'beginning,' but no definable end . . . and is never complete" (Yakovlev, 1972).

Also, the functioning of the human brain progresses on a similar basis as its structure. The two are quite directly related. It would appear then that functions must develop and mature as the basic necessary structures mature. For example, the learning of reading at first involves a distinct process of decoding. This in turn requires that the child establish visual-verbal association, as Rudel and Denckla (1976) point out, in one (or both) of the following ways: assigning speech sound equivalents to each letter or diphthong, and framing these into a word with which the child is familiar; or using whole sight words which are matched with spoken words. These visual-spoken language processes or pathways from visual areas to language areas of the brain are usually relatively late in maturing although there is a wide variance in timing from individual to individual (Geschwind, 1965). See also Chapter 10 on "Learning to Read."

Limitations of brain research suggest a further cautionary note: It is neither appropriate nor accurate to think of increases in brain weight, for example, as indicators of increased mental capacity. Similarly, there are other brain development sequences which to the behaviorist and the educator might appear to relate brain development and maturation directly to learning and education such as the progression of myelination, but this is inappropriate and misleading.

In spite of these restrictions and lack of knowledge, some achievements have emerged that clearly excite the imaginings of the student who attempts to understand the neurophysiological bases of learning. It is the objective of this chapter to briefly recapitulate some of these research findings. The central theme in this chapter will attempt to answer these questions: How does the human brain mature in structure or neuromorphology, and in functional capabilities? Is it possible to identify in the life of a child (a period of dramatic brain maturation) optimal time frames for academic achievements that are related to the neurophysiological substrates of development?

Gross changes in brain during maturation. At birth the average brain weight for a full-term infant is less than one pound (340 gms) or about one-quarter of the adult weight. All major brain regions such as frontal, parietal, temporal and occipital lobes that will later support sensory, motor and other complex functions are apparent but the posterior aspects (visual sensory function, visual projection area) appear more developed than the anterior ones (prefrontal areas concerned with emotional control and other cognitive functions--related to limbic lobe involved in the basic patterns of behavior). Also at birth the brain possesses virtually all of its brain cells, or neurons. With development and growth the neurons enlarge, become more expansive in their connections, and supporting elements multiply.

By six months the weight has about doubled (660 gms) in mass and the convolutions are deepening toward the mature state. The frontal lobe has enlarged somewhat from birth by this time but the major growth still appears to be taking place at the posterior or occipital brain areas. The white zone below the cortical mantle has become more distinct. At twelve months the brain weighs an average of 925 gms and shows considerable depth and enlargements of the cerebral convolutions. Hereafter the brain mass shows slower growth rate. For instance, a year later the average brain weight of a 2-year-old child weighs about 1064 gms. At this period of maturation (2 years) the brain is much firmer than preceding stages and the color of the cortical mantle is darker.

From age 2 until adolescence the growth of the brain is relatively uniform and without dramatic spurts; although girls gain slightly more brain mass than boys for the first three years of life (Aguilar & Williamson, 1969). After about 2 years of age the frontal lobe begins to accelerate in its growth and by the age of 6 this area is about equal to that of adults (Rabinowicz, 1974). The brain continues to grow in mass until the age of 25 years, but as indicated above, the maturation of the nervous system is not uniform in all brain parts throughout this growth period. For example, the brain stem is one of the first parts of the nervous system in the human embryo to begin proliferation. The cerebellum develops later.

The brain stem supports vital functions such as heart and respiration while the cerebellum, or little brain, is involved in coordinating skilled motor movements. Also, within the brain cortex there are variations of development from birth throughout the formative periods. In general, areas concerned with body sensations, vision, hearing and volitional control of motions mature early while frontal and temporal aspects involved with speech, complex recognition of sensory patterns, etc. are later to mature. Even when a child is born premature by several months, he must await an elapsed development time equal to his prematurity. Premature birth does not accelerate brain development. As there is no multiplication of neurons after birth the increasing brain is the result of progressive enlargement of existing structures and other cellular supportive elements.

Microscopic changes associated with brain development. The progressive maturation of the nervous system at the cellular level is relatively poorly understood. The process begins at about the fourth week post conception by neuroblasts located in the neural tube. By the eighth week of gestation simple somatic movements are first observed but by this time the basic organization of the reflex arc has been present for one or more weeks. In general, the intrinsic nervous elements are laid down in the embryo in a precise manner and the sequence of development follows along the pattern revealed by functional capabilities--namely, the motor or efferent system develops first followed slightly later by the sensory or afferent systems. Intrinsic connections between the frontal lobes and deeper brain structures, e.g. in the brain stem, are only beginning to emerge when the human embryo first shows reflex motions such as avoidance reactions (Humphrey, 1953). The order of development is rigorously controlled by the order and sequence of migrating and forming elements of the brain. The precise controlling mechanisms are not known. By birth, cells in the reticular formation appear reasonably mature.

In the postnatal period there is progressive elaboration of the axonic and dendritic trees of the growing neurons. The expansions of these processes are very important in establishing the neuron connections for handling electrical events in the nervous system at a later time. They have been examined in man by Purpura and Schade (1964) and in other animal species (Noback & Purpura, 1961). The results are as follows: Apical growth of the dendrite precedes basal dendritic growth. Synapses, the interface from one neuron to another, are established first on the apical dendrites (Schwartz, Pappas & Purpura, 1968), followed later in time by synapses being established on basal dendrites and the cell soma. Apparently it is important in the sequence of developing synaptic contacts between neurons that apical dendrites appear first followed later in time by the growth and elaboration of the basal dendrites. In some cell structures such as the caudate nucleus it is rare to observe synpatic contacts with neuron regions close to the cell soma even in the adult. Furthermore, neurons in deep structures of the brain mature earlier than superficial neurons of the cortex so that one can describe the maturation of the brain as it precedes up the neural axis. The dendrite pattern of the neurons begins to approach that of the adult by about 2 years of age, but the numbers and complexities of these patterns are still considerably less than in the adult.

There are only a few axons present at birth. Axons that are present course tangentially to the cortical surface. The great bridge of connecting fibers between the cerebral hemispheres in the corpus callosum are only partially developed at birth. As development continues, myelination of the axons follows the ontogenetic course of brain maturation. The greatest degree of lipid formation is in the brain stem, followed by the cerebral hemispheres with the cerebellum coming in near the last (Himwich, 1973). Prior to myelination the immature axons are ensheathed by an outer sleeve of Schwann cell that encompasses the bundle of naked axons (Peters & Muir, 1959). As the axons enlarge in diameter they conduct action potentials at higher velocities from one place to another in the nervous system. Finally the axon diameter increases beyond a critical level and myelin is formed around the individual axons with greater cellular industry. The formation of central myelin is complex, but the effect of myelination is to benefit the conduction of electrical impulses more efficiently and with greater speed and reliability. The general morphological features in the immature brain can be substantiated by concordant bioelectrical activity. In fact, most early research on the maturation of the nervous system originated in searching for ontogenesis of the electrical activity in the early brain.

Bioelectricity in the immature brain. Histological development of the brain can be closely followed by significant changes in the cortical electrical changes. In kitten brain, for example, cortical activation by peripheral nerve stimulation results in a surface-negative evoked response. (The surface of the brain is negative; deep, it is positive.) Apparently this results from synaptic activation of apical dendrites in the cortex of neurons that do not have well-formed basal dendrites (Scheibel, 1962; Purpura, Shofer & Noback, 1964). Correlative studies are necessary before more intimate understanding between maturation processes and physiological functions are available. However, in general, immature neurons, in contrast to adult cells, have lower firing frequencies (Ekholm, 1967; Hyvarinen, 1966; Skoglund, 1960), have longer-lasting hyperpolarization (inhibition) (Ekholm, 1967), are slower to conduct impulses (Skoglund, 1969), and have longer latency responses (Scherrer, 1968). All of these elctrical properties have the effect of reducing the number and velocity of impulse traffic in the central nervous system.

Functional capabilities in the brain are staggered along the time maturation lines of development. For instance, Marty and Scherrer (1964) have demonstrated that the somesthetic (tactile) sensibility in the forelimb precedes the auditory system which is ahead of functional maturation for the visual system in the cat. Presumably the same phenomena is true also for man since cortical development in man essentially follows these same patterns. In other words, the anatomic state of maturation dictates the functional emergence of brain function. For instance, the long-latency for response in immature brain is largely explained by the small diameter of the nerve fiber and general absence of myelination. Other factors may also play a role in slowing the response time in the immature brain. The consequence is that the sensory message to the brain and the motor reaction over a reflex pathway will take longer to complete in a very young person than in an adult. If the cerebral cortex is involved in any part of this reaction the process will take even longer. Therefore a young person does not possess a nervous system that ensures rapid response time to many events occurring within his sensory world in comparison to the adult. As brain maturation takes place these differences become less observable. Other electrical aspects may also be important.

Cortical evoked responses in neonatal animals show pronounced fatigability (Scherrer, 1968). While the term is not very precise in identifying possible cortical mechanisms, it essentially means that there is a reduction in cortical response when afferent stimulations are often repeated over short intervals. It is known that the efficiency of energy metabolism in the neonate is smaller than in the adult (Himwich, 1962) and undoubtedly the supply of energy sets the upper limits for conducting repeated stimulations to the brain. Refractory periods, the time intervals between successes in transmitting impulses in the neuron chains, are also considerably longer in the immature brain than in the adult, or are essentially less able tc process neural events or input and output at higher speeds. These factors probably account for age changes in the functional capabilities and in the spontaneous electroencephalographic activity of the maturing brain. Studies relating the ontogenesis of brain bioelectrical activity are important because they provide significant correlates with brain maturation and behavioral development.

The electroencephalogram of the developing brain. There is considerable evidence that immature fibers can conduct electrical impulses before they are ensheathed by myelin. It is supposed in fact, that the added nervous system processing capabilities acquired through acquisitions of various motor and sensory skills constitute no small demand for myelination to take place. As the progress of maturation marches on with proliferation of neuron processes and synaptic interconnections there are increasing complexities added to the cerebral functions. And with this maturation there is the emergence and differentiation of the electroencephalogram (EEG) that is thought to reflect the complex maturation changes that are taking place in the underlying brain tissue. Some of the earliest studies of brain development were focused on the ontogenesis of electrical activity. One of the first EEG recordings from immature brain was made by Hans Berger (1932). Since then there has been extensive literature available directed to the understanding of the developmental EEG in childhood (Gibbs & Gibbs, 1951).

At birth the EEG consists of irregular low-voltage waves alternating with periods of isoelectricity when very little or no activity occurs. At this early stage it is very difficult to observe sleep-wakefulness EEG patterns that emerge later in life that are so distinct to various conscious states

(Ellingson, 1972). The problem of identifying sleep or awake in the neonate is considerably more difficult than in the adult. Spindleburst activity that occurs just before and during slow-wave sleep does not occur until about the second month after birth. It would also seem that during this early period the altered states of consciousness are much different in comparison to those of the adult because the cycling mechanisms in the brain stem for awake and sleep are not as well developed. Rapid eye movement (REM) sleep is almost continuous and uninterrupted during the first few months after birth, even when the child is crying or engaging in other activities (Emde & Metcalf, 1970).

With each passing week during the early part of the infant's life the EEG undergoes changes. These changes are irregular and diverse in the same person as well as across individuals related by age. For example, at birth the parietal area is more active than other parts of the brain,* but by the sixth month the posterior or occipital lobe is usually more active than other brain areas (Smith, 1937).

The irregular slow wave activity in the neonate increases in frequency until by the first year the EEG is typically 5 to 8 hertz (Hz.). At this time the EEG arousal pattern is clearly different than the asleep pattern. With each successive year the frequencies steadily increase until the fourth year when the occipital record is 7 to 8 Hz.

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*The complete significance of this is not clear, but it does show that development occurs from core of brainstem outwards.

It is not until about the ninth year that the EEG record in the posterior brain region (occipital pole or visual cortex) is essentially like that of the adult. The trend toward higher frequencies is still progressive in the frontal aspects (concerned with emotional control and other cognitive function) and it is not until about the age of 14 that adult records are established with consistency. After 19 years most individuals have normal adult EEG activity in all cortical areas (Gibbs & Gibbs, 1951). In general, in the awake individual, the developmental EEG changes are from slower frequencies and higher voltages to faster and more complex waveform patterns. The prognostic value of the EEG in early life is of relatively limited value in identifying subtle abnormal brain development. Persisting isoelectric EEGs seen in children beyond a few weeks old indicate a very serious clinical problem and hyperactive tracings may herald major malformations of the cortex (Monod & Ducas, 1968). So-called moderately abnormal EEG in children is not reliable for diagnostic purposes since many normal children are observed with certain types of paroxysmal activity in the form of sharp waves and spikes during childhood. These intermittent electric phenomena generally tail off after the age of 14 years (Petersén, Eeg-Olofsson & Selldín, 1968). Longitudinal studies involving electrical patterns in developing children across time with increased penetration into the meaning of brain electrical activity are obviously needed. Also, the structural counterparts of the electrophysiology need to be more tightly coupled to these broadly defined neuroelectric data. Until the EEG is better defined the information from complex neuronal systems is elusive. The statistical methods involving pattern recognition have not in general been applied to analyzing or validating the developmental patterns observed in the maturing brain (Vaughan, 1974).

Determinants of neural plasticity. There is widespread belief that the shaping of neural ensembles that will eventually form the organization and behavioral constructs in the adult are determined by some kind of functional pressures. Also it is believed that the formation of the neural nets supporting a behavioral task starts as a fundamental reflex and expands as the elementary response emerges and encompasses more and more complexities. In other words, simple reflexes provide the behavioral substrate for all of our activities.

On the surface this postulate seems plausible but it is too simplistic. It is true that the commitment of the neural mass in the developing nervous system is not only intrinsically determined, but it is also influenced by demands from peripheral devices which the brain cells will innervate.

To isolate the genetic influences from the periphery adaptation is an incredibly complex task as far as reconstructing the interplay of these two influences. The orderliness and careful time sequencing of these proliferating events during development are fascinating and astonishing. In addition, though it will not be discussed here, there are complex biochemical influences, i.e. hormones and nerve growth factors, that are brought to bear in the developing brain (Prestige, 1970). The end product is an immense and complex brain capable of diverse actions throughout the body.

The duration of neural development is variable. And apparently the ordered time sequence from one brain system to another is only partly coupled with other systems. Thus the rate of development may be accelerated or slowed within the same species (Kollros, 1968). Often it does not proceed in a smooth fashion. Also the synchrony between the periphery and central nervous system suggests that the two developmental processes are interacting during maturation. At other times the brain development appears to be isolated from other nervous system elements. For instance, the motor system can develop in the absence of sensory input (Eccles, 1968). Consequently the motor system is capable of initiating and sustaining motor actions without sensory influences. Eventually, however, there is neuronal linkage between major brain systems via differentiation of populations of interneurons.

Once the bridge is established and maturation of the neurons is complete the brain continues progressive refinement of cerebral signals. This maturation is variously defined but is essentially associated with brain plasticity. The complex phenomena called learning is one aspect of brain plasticity. But so far only a few phenomena have emerged that shed some light on brain mechanisms involved in learning or memory storage. Most of the work gives only indirect evidences of how learning occurs.

Bennett, Rosenzweig and Diamond (1970) have shown that litter-mate rats exposed to so-called "impoverished" or "enriched environments" have significant cerebral cortical effects. The "enriched" animals have thicker cortex, increased enzyme acetylcholinesterase activity, greater number of glial elements and neuron cell somas of greater diameter in comparison to the animals reared in "impoverished conditions." (This does not necessarily indicate increases in mental capability in rats or humans.) Attempts to extrapolate these animal studies to man are not easy because of many unknown factors that might contribute to these effects. The results do point up the interesting prospect that the brain is more modifiable by environmental conditions and learning situations than previously thought. Clearly, the functional architecture of the brain must be capable of plastic and dynamic change. Otherwise how do we support memory or learning abilities?

The synapse is often thought of as one location in the nervous system where possible alterations may play a key role in neuronal plasticity. Other speculations involve changes in brain proteins or other macromolecules (Hydén, 1972). The issues are not resolved, though in the first case the problem is reduced to a statement that repeated synaptic usage strengthens or modifies synaptic connections (Eccles, 1970) whereas in the second case learning brings about chemical changes or synthesis in the neuron or glial. Support for either concept is largely derived from disuse experiments where the synaptic input is effectively reduced by dissection, lesions or chemical methods. At this time there is no compelling evidence to support the idea that only one mechanism underlies plasticity in the brain.

It is currently fashionable to view the brain as an information-processing system having a memory storage element with communications over input and output lines. Electrical events in this system are relatively short, i.e., a few milliseconds, and are responsible for managing sensory and motor actions, along with many other functions. The spike events (EEG movements or action potentials) are not durable in the same context as a learned experience. There is considerable evidence that the effects of learning can last a long time.

The efficacy of the learning process is not entirely known but there is a flowering of concepts within the last few decades. Briefly, the ideas center around an increase in the size of synaptic contacts, or an increase in sensitivity of the nerve membrane, or alterations in transmitter neurochemistry released at the junctions. These changes are thought to involve large populations of neurons and somehow retrieval of learned events must be extracted from these ensembles of many neurons (Galambos, 1967). Various factors can tone or affect learning. For example, learning is more efficient if motivations and rewards are clear and identifiable. In fact, there is doubt that learning can occur in complete absence of motivation and reward. We are doomed if our objective is to learn without reinforcement so that some reasonable sensory selection is involved in sorting out significant events by the central connections. Otherwise a phenomenon called "extinction" occurs and correct responses to unmeaningful and repetitious events become less likely. Attention and motivation are critical in the learning scheme and conceivably could facilitate or hinder learning consolidation. The point is that the details for understanding such a simple nervous system action as memory are obscure and we can only hypothesize possible neurophsyiological mechanisms. Various elements in the neuron chain can distort or render our learning useless. In the context of brain maturation, there is a difficulty in separating the nature and extent of genetic control from behavioral and cultural overlays. Both of these factors can thrust effects upon the molecular level of the brain, as evidenced by the maturation pattern of developing neurons and the fact that the learning process involves some durable changes in biochemistry, electrophysiology or anatomy of the brain. Genetics may also have an influence later in childhood by switching in effects during behavioral adaptation.

Implications for psychology and education. Obviously, not all of the developing aspects of brain growth and maturation are summarized above in this chapter. With the power of the scientific enterprise only a few facts have been durable over the last 50 years. "We are at the beginning, and not near the end, of the process of understanding development. This is not the time to summarize, but a time to prospect and project into the future; and the best thing is to turn for guidance to the living object which teaches us the lessons and also teaches us the real problems to which we are to direct our questions" (Weiss, 1958). It is apparent from both educational studies on how children learn and from the maturation of the brain that improved technology may not improve or potentiate intellectual growth. First, the child must achieve maturation of the brain. This comes about through neurbiological strategies and mechanisms in brain cells during development. Based upon the neurobiological framework of brain development it would be wrong to establish some precise cut-off point that defined the brain as fit or unfit for learning. There are sensory motor percursors for symbolic intellectual activities. When language is acquired, new brain functions emerge. Verbal reasoning does not begin before that time (Escalona, 1974). There are qualitative breaks in the unfolding of intelligence and conscious experience but from our current understanding of brain development these follow the growing capacity to process simultaneously multi-sensory information. There is something very deeply neurobiological about these maturing processes (Williams, 1970).

## CHAPTER VI

## NEUROPSYCHOLOGICAL FACTORS IN LEARNING

Synopsis. Although there are gaps in the present status of knowledge of those who attempt to relate the research findings of experimental child psychology, education and clinical psychology with medical findings, it appears that many neuropsychologists and neurophysiologists now are aware that there is a close relationship between structure and function in the development of the young child's brain.

We do not yet have clear evidence that brain weight and myelination are significantly related to learning, yet other factors, which are more clear, indicate indeed that function is closely related to maturational structure of the brain. The great cerebral commissures and certain nerve fibers are not complete until after the age of 7. Lateral responses on the EEG in terms of cognitive activity do not stabilize before 8 or 9 years of age. Normal adult brain wave patterns are not fully established until about 13 years. The latency of response to stimulus reaches adult values at about 14 years. (Note the conclusions of learning specialists such as Robinson, Rohwer, Elkind and Bereiter who suggest waiting until ages 10 to 14 or adolescence for formal instruction in the basic skills. See Chapter 13 and also Chapters 4, 7, 11 and 12.)

Although research indicates certain sequences of brain development, we do not yet know for sure how they affect a child's learning potential in relationship to his age. Nevertheless, multi-disciplinary research analyses in neural-related areas--visual, auditory, tactile-kinesthetic, etc.--provide clues to a relationship between the maturity of the brain and learning and behavior. Vision and hearing, for example, are neuropsychological senses or processes which are part of, and emerge from, the brain. Learning activities that overload these senses may therefore also produce stress of the central nervous system (CNS). For example, it was found that much close work by young children usually produces nearsightedness. There is also some support for the belief that anxiety level in school children is related to the development of myopia.

Although hearing acuity is achieved somewhat earlier than visual maturity by most children, the two major modalities, auditory and visual, seem to equalize in function by age 9--the age suggested by auditory perception specialists as providing auditory perceptual readiness for basic skill learning. Learning difficulties may arise from emphasis on new learning at the conceptual level before a proper perceptual base has been established. Moreover, a child who enters school with inadequate perceptual development may never catch up in achievement even after his perceptual processing ability is fully developed (usually by age 9). The ability to transfer information across sense modalities, and to interpret this information, apparently is not developed until 8 years of age or later.

The weight of evidence in the neuropsychological field points to an optimum time for the learning of academic skills by the child and this does not appear to occur until after age 7, and perceptual training does not appear to speed up this development, with the possible exception of the slow child whom it may help to reach his highest learning potential.

Although research data is obviously limited respecting the bioelectrical and biochemical functions--or more simply, internal functions--of the human brain, there are enough human response and behavioral or external indicators to provide a substantial body of knowledge relating to human learning and behavior. Yet extreme caution must be observed in relating areas of perception, as indicated by external means, to what appears to occur inside the brain.

To fully understand the function of the nervous system requires, among other factors, a comprehensive knowledge of the specific chemistry of single neurons and the specific connections and their localization on the neurons in various functional systems.

There are gaps in the present status of knowledge for those who attempt to relate the research findings of experimental child psychology, education and clinical psychology with medical findings (Chalfant & Scheffelin, 1969). This is particularly true when one is searching for evidence on neuropsychological readiness for school tasks.

Yakovlev (1972) cautions "against transposing the terms and definitions of biomorphological research into the plane of pedagogical and psychological concepts and definitions." Likewise, Metcalf (1974) states that "it is not 'legitimate' to make a psychological or 'educational' conclusion from the physiological data." Yakovlev, however, confirms "that structural maturation of the brain appears generally consistent with Piaget's period of concrete operations."

The close relationship of structure and function in the development of the young child's brain now appears to be widely accepted among neuropsychologists and neurophysiologists. It is the interpretation of this concept that is the principal concern of this chapter. The basic question might be posed in this way: Is there a positive or parallel relationship between the structure, maturation and development of the brain, on the one hand, and academic achievement on the other? Or does available knowledge of the maturation and development of the brain at a certain stage in the child's life suggest that it is at this stage that he is ready to perform the tasks needed for academic learning as made possible by the current development of his central nervous system? With available research, it is not safe to say so at this time.

Age-related changes in brain development. Most of our knowledge of brain structure and function stems from the experimental study of animals. Scherrer (1968) concluded that the higher centers of the young animal seem to be able to receive and treat only a relatively small amount of information per unit of time, and that the treatment of this small amount of information is processed in nerve circuits that function more slowly than those of adults.

Huttenlocher (1966) and Ellingson and Wilcott (1960) investigated the brain development of kittens, and both studies indicated that there were striking differences between the neuronal activity and auditory and visual responses of young kittens and adult animals. A number of other studies are available relating the differences between immature and adult brains.

Bennet et al. (1964) and Rosenzweig, Bennett and Diamond (1972) endeavored to answer the question whether experience and training in rats produced any observable anatomical and chemical changes in the brain. Bennett found that increase in weight and thickness of cortical tissue and in chemical activity of the brain were directly related to the amount of environmental stimulation (enriched experience) given to the rats. Rosenzweig and colleagues obtained similar results, but cautioned that it was difficult to extrapolate from an experiment with rats under one set of conditions to the behavior of rats under another set of conditions. And it was "much riskier to extrapolate from a rat to a mouse to a monkey to a human."

The fundamental processes of lower animals never present the same complexity of systems to be found in the higher animals (Skoglund, 1969). Brain changes similar to those in the rats of Bennett and Rosenzweig have been found in several species of rodents, and this appears to have given rise to the assumption that similar results may occur in carnivores and primates, including man. Ellingson and Wilcott (1960) believe that one of their laboratory investigations has shown that the occipital evoked responses to light flashes tend to display characteristics and developmental changes in the human input similar to the responses of very young lower mammals. Further research is necessary to test the validity of such conclusions (Rosenzweig, Bennett & Diamond, 1972).

Studies of human development by Robinson and Tizard (1966) and Tanner (1961) indicate that the brain of a full-term newborn human infant is 25% of the weight of the adult brain, compared with a proportion of 5% for other organs. Only eyes are nearer in size to adult value. By 6 months the brain weight has increased to 50% of adult weight, by 1 year to 60%; 5 years, 90%; 10 years, 95%. The weight of the brain at birth is relatively constant, in spite of much variation in the body weight of infants. Unfortunately the increase cannot be safely related to educational implications. As noted in the previous chapter, brain weight has not been shown to be significant among factors regarding mental capabilities.

The neurons are all present by 7½ months after conception, and the subsequent growth of the brain is mostly due to deposition of myelin and to a vast elaboration of dendrite processes, along with a considerable increase in vascular tissue. Myelination continues at least through adolescence, and Yakovlev (1972) believes that this development may continue well beyond the ages of 30 or 40. But we do not yet have clear evidence that myelination is a significant factor in learning.

Other factors are more clear, however. Robinson and Tizard (1966) and also Tanner (1961) suggest that during the first two years after birth the appearance of function is closely related to maturational structure. Motor development is in advance of sensory development, but by 2 years of age the primary sensory area has caught up with the motor area. Sensory development continues, however, for a number of years. The nerve fibers coming from the thalamus to the cortex are not yet complete at 7 years of age (Yakovlev & Lecours, 1967). The reticular formation, an important arousing system, is not fully developed until the 10th year or later, and the great cerebral commissures are not complete until after the age of 7. In other words, there may be inadequacies at 7 years of age. But we don't know for sure what these are or what they represent. The developmental process continues throughout life.

As development proceeds, there are progressive changes in the rhythm of brain waves (Nelson, 19640. In newborn infants the cortical rhythm is poorly developed. As the brain develops, random low-frequency (delta and theta) waves appear, but gradually the basic rhythm becomes more regular. By 6 years of age the pattern is made up principally of theta waves. By the age of 10, alpha waves, characteristic of the normal adult brain, tend to predominate.

In adolescence some slow-wave activity is not uncommon and may be incorrectly interpreted if adult standards are used. The electroencephalogram (EEG) of infants and children is more difficult to interpret than the EEG of adults because of the presence of slow rhythms in some normal children. Such slow waves have also been found to be characteristic of senile or "childish" adults, but in normal adults the higher-frequency waves (alpha, beta and gamma) are present in the waking state (Nelson, 1964).

Metcalf and Jordan (1972) have come to similar conclusions about the development of brain waves in children. The course of EEG development is not smooth nor clearly predictable. It changes throughout the life cycle, being rapid during the first two years and accelerating through adolescence. After adolescence the trend is toward a leveling off of development. There is increased variability in the individual after ages 3 to 4 (Metcalf & Jordan, 1972).

By age 5 the alpha rhythm predominates in the brain waves, then from 6 through ages 11 to 13 higher-frequency (alpha) waves appear more and more (Tanner, 1961). Electrical activity is present early in fetal life, but the normal adult pattern of the EEG is not reached until about 13 years of age (Robinson & Tizard, 1966).

The latency of the response (or interval between stimulation and responses) of a newborn infant is remarkably long compared with that of an adult, or even an infant of 10 weeks, at which age the adult latency has almost been reached. The duration of the responses increases throughout childhood, with particularly rapid changes in the first four months. Adult values of response duration are reached at about 14 years of age (Robinson & Tizard, 1966).

Though EEG responses do show differences which occur through further development and maturation, little is known regarding their implications for educators. Any attempt to do so is likely to confuse rather than clarify the situation.

The development of laterality or the performance of cognitive tasks by a specific hemisphere of the brain, is also an age-related function. Metcalf's (1974, 1975) findings suggest that although lateral changes in the EEG are present very early in life (according to some, during infancy, which Metcalf did not confirm), lateral responses on the EEG in terms of specific congitive activity do not stabilize until around 8 or 9 years of age. Furthermore, it appears that many aspects of the EEG do not stabilize until after 9 years of age, and even during the 9- to 14-year-age period there is much EEG instability.

The development of lateral dominance in the brain is evident in perceptual-motor functions which become more precise as age increases. The eye-hand coordination subtest of the Frostig test yielded scores suggesting that eye-hand coordination is a skill that is still developing through the teen years (Briggs & Tellegen, 1970). This challenges a frequently-held belief that visual-perceptual development levels off at age 7 or earlier.

There seems to be no significant relationship between the emergence of lateral dominance and intelligence (Hillerich, 1964). Nor does the establishment of consistent right- or left-handedness have a beneficial effect on learning to read (Balow & Balow, 1964). But while lateral dominance does not seem to affect reading ability, retarded readers do have difficulty in distinguishing right from left in their own bodies and in right-left awareness (Birch & Belmont, 1965). Such difficulties are most likely a result of poor neurological development (Mariam, 1954).

Brain function and intellectual achievement. Tanner (1961) suggests that fluctuations in IQ must certainly reflect differences in rate of development of mental ability that correlate with differences in rate of development of the brain itself. Whether experience or stimulation can have an accelerating effect on the course of brain maturation, or whether the course of brain development in itself, if speeded up, can result in the easier performance of school tasks are questions that cannot be answered simply. They must be "answered in terms of the resultants of complex interactions, of experiential, developmental and maturational factors" (Metcalf, 1974).

Here again sound research provides indications of the sequences of brain development. The problem and the question are: How does this affect a child's learning potential in relationship to his age? And the answer is: We do not know; we can only speculate. The best answers to this question are probably found from research and experimentation in learning (including readiness), comparisons of age and achievement (including comparative school entrance age studies) and factors relating to vision, hearing, intersensory perception, and research in reading. These are more fully discussed in the pages following. The synergic effect resulting from this multidisciplinary approach may offer some clues to the brain's secrets respecting the relationship of its maturity to learning and behavior.

Perceptual training can help a child who is lagging developmentally to perform to his highest potential, but it seems unlikely that perceptual training actually speeds up development (Ames, 1969). General health (Shepherd, 1969), including nutrition, probably has a greater effect on neurological development and the resulting intellectual performance. Cravioto, DeLicardie and Birch (1966) have suggested that malnutrition delays neurointegrative development. A delay in mental growth interferes more with achievement in learning than the general social background of a child, according to Milgram and Ozer (no publication date) who studied the effects of neurological and environmental factors on language development with a group of Head Start children during the summer of 1965.

Visual perception. Vision is a broadbased neuropsychological process (Krippner, 1971). Even though a single, clear visual image may be received by the eye, a child still may not be able to decode printed material because of deficiencies in organization and interpretation present in the central nervous system due to lack of maturation. Though it is generally accepted that the human eye is as fully functional as the adult at birth, there appear to be many other factors affecting overall vision--from the difference in plasticity of a child's eyes to that of an adult's to and including the developmental advancement of the visual cortex and other related neurological findings.

There is some correspondence in the development of the eye itself and that of the nervous system as a whole. During the first three years of life the eye increases in size (Robinson & Tizard, 1966), but there is no drastic change in refraction (Young, 1970). Then there is a clear visual progression from 3 to 7½ years of age, with visual perception disabilities virtually disappearing after the age of 10 (Frostig, Lefever & Whittlesey, 1963). By the age of 13 or 14 the eye has reached its maximum growth (Young, 1970).

Animal studies indicate that the visual system of the brain develops later than the auditory (Ellingson & Wilcott, 1960). Work with young children seems to bear this out. The results of a study by Stevenson and Siegel (1969) suggest that children in the primary grades are more responsive to auditory materials while older children pay more attention to visual materials. At the time when most children enter school, the visual-perceptive mechanisms are still incomplete compared to the development of adult mechanisms (Dyer & Harcum, 1961).

Nearsightedness (myopia) is frequently the result of prolonged looking at near objects at an early age (Young, 1970). Young children and young monkeys are normally distant-vision creatures. In studies with monkeys, Young (1962, 1963) found that they developed myopia when they were kept in a restricted visual environment. Young et al. (1969) reported a study of Eskimo families in Barrow, Alaska, in which up to 58% of the children had myopia, whereas both grandparents and parents showed virtually no myopia. It might be concluded that the children's myopia is related to a closed-in environment characteristic in school attendance since other conditions remained virtually constant, and education in Alaska was not compulsory for the older generation. Ludlam (1975) concurs with Young's findings on early myopia and strongly suggests that reading earlier than the sixth or seventh year is often responsible.

There is also some support for the hypothesis that the anxiety level is related to the development of myopia (Streff, 1974). In a study of visual changes occurring in public school children, the incidence of myopia was reduced as changes were made in the school program. These program changes were related to developmental placement of children and tended to reduce stress as the children were developmentally ready to do the work expected. In 1970, 19% of the sixth graders in this school were myopic and in 1971, 27% were myopic. In 1974 sixth graders who had had the advantages of the program changes showed a significant decrease in myopia, with only a 4.4% incidence for those who had been in the system during their entire school years.

From these studies it is evident that myopia cannot be ascribed to heredity. It is more a matter of adjusting vision to near objects over a period of time. It can occur in later life as well as childhood, but with adults the strain is on the lens rather than the immature eyeball.

A U.S. Navy study (McKay & Ryan, 1974) found that experienced submariners had more myopia than submarine school candidates or Navy divers or similar groups, and ascribed it to the fact that the submariners had to accommodate or adjust their vision longer to shorter distances than the other groups.

These recent findings support the observations that Hilgartner (1962, 1974), an ophthalmologist, made from clinical data accumulated by him and his father in Texas over more than 50 years. His records show that in 1910 there were 7.7 cases of farsighted children to 1 nearsighted child. By 1935 this ratio was 1.8 farsighted children to 1 nearsighted child. But by 1962 Hilgartner reported a reversed ratio with 1 farsighted child to 5 nearsighted children!

These changes in ratio of hyperopes to myopes corresponded to the progressive lowering of school entrance age laws in Texas since 1910. Hilgartner suggested that the accommodation or adjustment of the eyes to restricted areas in schoolwork, and more recently to television, might have been a factor in these changes. Newton (1972) supported Hilgartner's findings and noted that myopia still seems to be increasing.

Visual and visual-perceptual deficits are frequent among elementary school children. Coleman (1968) reported that half of the children in a sample from grades 1 through 6 had visual, visual-perceptual, or refractive errors, with

70% of these visual problems among males. Buktenica (1968) concluded that the child's development of visual skills is directly influenced by inborn tendencies, physical characteristics and environmental factors. Both environmental and developmental factors were emphasized by Frostig, Lefever and Whittlesey (1963) who pointed out a connection between disabilities in visual perception and poor classroom adjustment at lower age levels. Further study is needed to determine what relationship actually exists between developmental age, the visual demands made of children and the concomitant problems in vision.

Auditory perception. The development of hearing acuity is also a function of age, but it is evidently achieved somewhat earlier than visual maturity by most children (Marty & Scherrer, 1964; Stevenson & Siegel, 1969). While the development of visual perception proceeds through later childhood and into early adolescence, satisfactory auditory perception and discrimination of sounds is usually acquired by the eighth birthday (Wepman, 1960).

From 5 to 8 years of age Impellizzeri (1967) noted a consistent increase in auditory perceptual ability with an apparent relationship between physical maturation and success on the auditory perception test. Similarly, third graders were able to interpret and order auditory stimuli more readily than first graders (Riley, McKee & Hadley, 1964). The younger children could distinguish between amplitude or loudness and softness, but had difficulty in the discrimination of frequencies, or high and low pitch.

Riley et al. (1967) observed that first graders did not respond to frequency of sound in the same sense as they did to amplitude, nor in the same sense as did older children. All the children performed more accurately with amplitude problems than with frequency problems, but the older children were superior to the younger children. According to the developmental capacities of children, training in perceptual discrimination has also been productive. While auditory discrimination ability has been found to be very low for some deprived children, specific training along with social and verbal interaction effectively improved this ability (Strag & Richmond, 1973).

Intersensory perception and integration. Birch and Lefford (1963) studied the relationships among visual, haptic and kinesthetic sense modalities. For geometric form recognition, they found that the ability to make various intersensory judgments are well developed by school entrance age. However, full effectiveness in using the intersensory information is not reached until later.

Wepman (1968) examined the early progress of children as they developed the capacity to utilize their maturing neurological systems, and concluded that maturation and development of the neural system is hierarchical, yet interrelated. He defined maturation as the establishment of the neural components necessary for sensory tranmission and integration, and for motor transmission of signals within the nervous system. Development he defined as the functional adaptation of an established neural pathway. A time-bound progression of the neural system builds each succeeding layer upon previously developed layers, both in the sense of maturation and of development. It parallels the physiological maturation of the central nervous system insofar as can be determined. The following paragraphs summarize Wepman's findings:

Each person has a particular modality of choice in learning--auditory, tactile or visual. Thus there is a differential use of separate input pathways. For example, the audile child not only matures earlier in an auditory sense, but also develops his mature pathway with greater ease than other children. This differential modality distinction appears to be more a result of innate capacity than environmental factors. Wepman found no specific lack of stimulation in the homes or environments of children with poor auditory learning, or poor visual or tactile-kinesthetic learning. The children came from all types of homes.

Wepman further indicated that the use of a neural pathway helps it to develop so that it becomes completely functional at an earlier age than it otherwise could. Usually, the modality showing the most rapid development indicates the child's predilection. Thus some children are predominantly hearers, some seers; but the two major modalities--auditory and visual--seem to equalize in function by the age of 9. Whatever lags in development have been present seem to be overcome by that age.

Many children with learning problems have greater facility in the use of one input pathway over another. For example, the transmission of auditory signals may be good while visual or tactile signals may be poorly transmitted. To ascertain the effect of modality preference on learning, it is necessary to isolate the preferred modality (auditory or visual) and assess the level of achievement and potential for training whatever modality is delayed in its development. Visual-motor and motor-kinesthetic pathways need equal attention, according to Wepman. Children slow at developing any of their perceptual skills, regardless of modality, will find it difficult to learn, since there are no other avenues open for learning.

Wepman distinguishes between two kinds of learning: the perceptual, prelinguistic, preoperational learning (sensory-motor) and the more complex conceptualizing type of learning with comprehension and intent. Learning difficulties may arise from emphasis on new learning at the conceptual level before a proper perceptual base has been established. At the beginning stages of learning, attention must be given to the perceptual level in order to develop a basic structure for later learning at the conceptual level.

Problems cannot be solved without basic facts. Yet children are often expected to learn conceptually (comprehend) before they have developed the modalities of perception (auditory, visual and tactile-kinesthetic) necessary for comprehension. Maturing perceptual levels are indicated by the progressive achievement of skills such as discrimination, retention, recall of sounds and letters, sequential ordering of phonemes and graphemes, and the ability to interrelate one thing with another. Wepman concludes that this ability to form minimal contrasts continues to develop in most children through their eighth year.

Morency (1968) observed that perceptual abilities develop significantly during the first three years of schooling and progress individually along lines of modality (auditory, visual, tactile-kinesthetic) preference at differing rates in the same individual. Improvement occurs in both auditory and visual perceptual ability from the first to the third grade, and perceptual difficulties at the beginning of school may somewhat influence the level of school achievement for the next three years (Wepman, 1968, came to a similar conclusion). Morency (1968) also noted that the developmental level of the various modalities is of crucial importance for successful early learning and achievement in school. Perceptual readiness strongly influences later school achievement (Morency & Wepman, 1973). Generally, the child who enters school with inadequate perceptual development does not ever catch up in achievement even after his perceptual processing ability is fully developed, which usually occurs by the age of 9.

According to Morency (1968), most children in elementary school learn by any method that is used. But there are always a few children who may not be ready for academic learning because one or more of the perceptual pathways is not sufficiently developed and with perceptual deficits, learning is difficult. Grouping children into "hearers" and "seers" can result in more efficient teaching and less frustrated learning, since the modality that functions most adequately may be used to support cognitive learning (Morency & Wepman, 1973). A poorly developed modality may be improved through special training if its functioning is less than its developmental potential (Ames, 1969). However, by age 8 or 9, hearing (Morency, 1968; Wepman, 1968), and between ages 10 and 14 vision (Frostig, Lefever & Whittlesey, 1963), have reached their full development, and both training and learning can then proceed unimpeded by developmental deficits.

When a child has lacked opportunities to use his perceptual capacities or has become apathetic, stimulation and training can arouse his latent abilities. Rosner (1972) identified the perceptual skills needed to prepare for reading and arithmetic, and concluded that they can be taught to young children. Such training can be most rewarding for a child when he learns to use perceptual skills of which he is developmentally capable. But struggling to acquire skills beyond his developmental level can be extremely frustrating and discouraging.

Rosner suggested that for competent school performance, visual-motor skills should indicate an ability to analyze and organize visual data according to spatial attributes, to see specific visual patterns against larger and more complex patterns. Auditory-motor skills should indicate an ability to hear specific sounds and acoustical patterns extracted from the larger auditory environment. Rosner (1973) found highly significant relationships between auditory perception and primary reading achievement, and between visual perception and primary arithmetic achievement.

Other researchers have noted increased learning abilities when cross-modal communication develops (Geschwind, 1964; Beery, 1967; Rudnick, Sterritt & Flax, 1967). The ability to experience an object through seeing or feeling it precedes the ability to speak the name of the object. Then after experiencing the object through the senses and hearing the sound of the name, one can more easily decode the graphic representation of the printed word (Geschwind, 1964).

The ability to transfer information across sense modalities apparently is inadequately developed in preschool and kindergarten children. Jessen and Kaess (1973) gave 3- and 5-year-old children visual and visual-haptic experiences with various complex shapes, and then required them to identify the shapes by sight or feel. The children performed more accurately on visual tests than on haptic, but gave almost no evidence of cross-modal matching.

By the age of 6 this development of haptic-visual transfer seems to be relatively complete with regard to the identification of shape. However, the ability to interpret information about the size and orientation of figures develops more gradually (Conners, Schuette & Goldman, 1967). Eight-year-old children have achieved a highly differentiated sense of touch and are able to judge the sensory quality of a multi-dimensional object (Krantz, 1972).

Although intersensory integration is a distinct advantage in learning, it is evidently not the only or even the primary skill responsible for improved achievement with increasing age (Vande Voort, Serf & Benton, 1972). A total readiness--physical, social and mental--maximizes and strengthens learning achievement involving perceptual processes.

Implications of neuropsychological factors. The weight of evidence in the field of neuropsychology points to an optimum time for the learning of academic skills by the child. There is a period in which growth, maturation and development combine to make available to the child the abilities needed for structured learning in the school setting. And this stage is apparently not reached by the ages of 4, or 5, or even 6 years.

As has been pointed out, the brain reaches 90% of its adult weight by the age of 5 years and 95% by the age of 10 years (Robinson & Tizard, 1966). But the child's perceptual mechanisms are not the same as adults since myelination continues far beyond 10 years of age (Yakovlev, 1972), and normal adult brain wave patterns are not fully established until about 13 years of age (Tanner, 1961; Robinson & Tizard, 1966). The latency of response to stimulus does not reach adult values until about 14 years of age (Robinson & Tizard, 1966).

Fluctuations in IQ reflect differences in the rate of development of mental ability which is apparently correlated with differences in the rate of development of the brain itself (Tanner, 1961). Perceptual training does not appear to speed up development, although it may help a child who is slow in his development to perform to his highest potential (Ames, 1969).

Visual improvement shows clearly from 3 to 7½ years of age and disability in visual perception usually disappears after age 10 (Frostig, Lefever & Whittlesey, 1963). Auditory perceptual ability shows a regular increase in success during the period 5 through 8 years of age (Impellizzeri, 1967). Haptic-visual transfer of information is not complete until about 8 years of age (Krantz, 1972).

Wepman (1968) delineates the relationship between physical maturation and success in tasks requiring auditory, visual and haptic perception. The nature of the maturation and development of the neural system is hierarchical yet interrelated. It is a matter of time, with the perceptual base preceding the conceptual level. Perceptual abilities continue to develop through the primary school years and determine the child's ability to learn in later years. Conceptual learning is more difficult before the requisite intersensory perceptual skills are developed at approximately 8 to 10 years of age, or even later.

# CHAPTER VII

# READINESS FOR SCHOOL

Synopsis. School entrance ages, whether by legal or social mandate, tend to be generally arbitrary in nature. There are no systematic, research-oriented guidelines which might provide reasonably uniform entrance age laws. So parents in Arizona or Pennsylvania are normally free to keep their children at home until 8 or later, where such practices in California (California, 1973) or Michigan (Michigan, 1973, 1975-76) may bring social and legal harassment, arrest or even jail (Moore, 1976a). In some of the United States, children must enter school as early as age 5. In some states they may enter as early as 3 or as late as age 9 or older. In France the general entry age ranges down between 2 and 3 (Moore, Kordenbrock & Moore, 1976).

Although public policy and conventional practices appear often to ignore it, research has much to offer with regard to optimum readiness levels for school entrance.

It appears that readiness for formal school learning includes age-linked experience and knowledge that contributes to certain cognitive-structural changes for the learning of concepts. Attempts to speed up conceptual learning through specific training have been found to be ineffective. Yet a wide range of ordinary life experiences appears to be basic for optimal cognitive readiness. There must also be a corresponding readiness of the physical and motor capacities. Full development of the perceptual processing ability is not usually reached before the age of 9 years. However--and unfortunately--neurophysiological readiness is a variable frequently overlooked in evaluating school readiness.

Readiness for school generally may be acquired at any socioeconomic level. Although social class may influence the way a child functions and the way his experience-related intellectual abilities develop, SES differences tend to narrow as age increases and to disappear after age 7 or 8.

Acceleration of bright children may be sound practice but research shows that delayed schooling with acceleration at a later age is more effective and is less damaging mentally, socially and emotionally than early school entrance. In fact, many studies show that, except for certain types of severely deprived or handicapped children, children who are older at school entrance generally do better at school in all aspects of learning and adjustment than younger children.

Since children develop at different rates, including sex-related differences, a specific age at which they are ready to begin a formal school program cannot be precisely fixed. Overwhelming evidence on readiness points to later rather than earlier school entrance--seldom before 8, and often 10 years of age or older. Delaying school entrance until the child is developmentally ready would require greater flexibility of school age regulations in most states and would necessitate policy reform at local state and national levels for it to become a reality. This does not suggest that an 8- or 9-year-old should enroll in the first grade, but rather with his social peers. Experience has proven that he usually will quickly catch up with, and often pass, those who have entered earlier.

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In recent years much has been done to determine the overall development appropriate for the academic education of children. The time to begin formal learning in a situation especially structured for that purpose should be a milestone in the child's intellectual and social development. Many diagnostic tests have been developed in a search for optimum readiness levels for school entrance (Ames, 1963; Ames & August, 1966; Ahr, 1967a; Kaufman & Kaufman, 1972). While there still are complex variables which sometimes confuse (McCarthy, 1955; Brenner & Stott, 1973), a systematic review of the literature has much to offer and for many it induces deep questions and convictions regarding public policy and conventional practice.

School entrance age laws, for example, appear to be generally arbitrary in nature (Forgione & Moore, 1975). Yet there has been a wide variation in school entrance policies in the U.S. Data compiled in 1966 showed that in some states children could enter elementary school as early as age 4, or they could be exempted as late as age 9 (Steinhilber & Sokolowski, 1966).

In some areas of Europe most children are in school even earlier--e.g. by 2 or 3 in France (Moore, Kordenbrock & Moore). Recent U.S. studies show little change in public policy which demonstrates careful, research-based attention to school-entry legislation (duPreez & Moore, 1976). Compulsory entrance ages ranged from about 5 years 8 months to 8 years, depending in many cases on the child's birth date. In fact there have been few changes in the last decade except those which have tended to push academic-type instruction below the first grade. In these movements, the appropriate age for beginning such structured learning has for many become even more obscured or confused.

For some there is uncertainty as to whether a child must have developed a readiness for school before he is subjected to academic-type instruction (Brenner & Stott, 1973), or whether formal school training is a prerequisite for a broader readiness (Rosenthal, 1969). Rosenthal's findings suggested that both of these circumstances were operating in a group of kindergarten children. In assessing their reading readiness, she found that the readiness achievement of the younger children was related to their kindergarten training. For older children, however, who had achieved readiness without kindergarten training, maturation was deemed important.

The nature of readiness. Before school readiness can be determined with any reasonable assurance, its nature must be understood. Jensen (1969) refers to readiness as the achievement of certain subskills along with the developmental maturity to integrate these subskills into a desired skill. If the desired skills to be attained are stated in terms of eventual competence in reading and mathematics, for example, what subskills are necessary and when and how are they achieved?

McCarthy (1955) examined pre-entrance variables necessary for school success and concluded that intelligence was only one of many factors. In addition to IQ, he identified such characteristics as social maturity, emotional stability, self-reliance, and physical health. He also found a definite relationship between a secure home environment and school success. As noted in Chapter 2 parental attachment is a factor which deserves far more attention in terms of educational readiness than it typically receives. The total balance or imbalance of development must be considered in determining readiness for school (Gelles & Coulson, 1959).

The interaction of all aspects of readiness in successful school achievement was evident in a 15-year study on children's readiness for school (Brenner & Stott, 1973). In this study 69 variables were analyzed, including the age of the children at school entrance and at the time of testing. From the intercorrelations of these variables, factors were identified that influenced school readiness. Some were of a biological nature and followed a biological timetable. Others were the products of experience. But all aspects of readiness were the result, in some way, of the interaction of hereditary potential and environmental forces, a balance between maturation and environmental experiences.

Brenner and Stott concluded that generally the older a child is, the more he will have grown in structure and function and the more he will have accumulated in life experience and understanding of the world around him. And the greater his body of knowledge before he goes to school, the more successful the child will be at the beginning and in subsequent school years.

Kohlberg (1968) presents a similar view. His cognitive-developmental analysis defines readiness as a function of age, IQ, and the general background of experience and stimulation. He notes further that the speeding up of cognitive-structural change is extremely difficult although once a structural change has been achieved, it may form a basis for future cognitive development. On the other hand, the early learning of specific information (language, labels, etc.) is quite easily achieved but is not likely to have long-range effects on cognitive development.

Thus while specific early stimulation and training designed to speed learning may appear to have value, according to Kohlberg it does not justify teaching things earlier that will come later with less effort. For example, children can be taught with relative ease to recognize letters or the names of animals at an early age, but this does not necessarily advance cognitive development. Kohlberg's viewpoint suggests that although naming and discriminating may cause a temporary rise on an IQ test for preschool children, during grade school this type of information can be acquired with much greater ease, if it has not already been picked up, and the IQ gain disappears.

The analyses of Kohlberg and of Brenner and Stott imply that readiness for formal school learning must include general age-linked experience and knowledge that contributes to certain cognitive-structural changes for the learning of concepts. The biological timetable of development makes ineffective the attempts to speed up this learning with specific training. But a wide range of ordinary life experiences is valuable, and in fact appears to be basic for optimum school readiness.

There has been much conjecture and study of the idea of "conservation" as introduced by Jean Piaget (1952) with its implications for abstract reasoning, cause and effect relationships, understanding of motivation and consistency in reasoning and judgment. The age-linked ability to interpret experience appears to enable a child to acquire the ability to conserve, e.g., to recognize that a substance does not change simply because the shape or appearance of an object is changed (Sigel & Hooper, 1968). Kohlberg (1968) concludes that this conservation concept is the result, not of maturation only, but of interactional experience between the individual and the environment.

This acquisition of conservation is not dependent upon linguistic skill, according to Kohlberg. Deaf children with no verbal skills of any kind have been able to achieve it (Furth, 1966). A lack of verbal skill apparently becomes a deterrent to learning primarily when a child is expected to use a vocabulary foreign to his particular experience (Labov, 1970). Of course, as Kohlberg points out, verbal skills can be developed with specific training. If the concept of conservation is also a readiness factor, there probably is little reason to stress vocabulary learning early if it can be acquired spontaneously with age and experience.

The interactional sequence delineated by these findings suggests that experience, supplemented by developmental maturity, produces the cognitive ability to conserve. This ability to think in conservation-type terms, plus some verbal skill in the specific language used as a learning medium, normally produces a readiness necessary to succeed in formal school tasks.

To support mental readiness for academic achievement there must be a corresponding readiness of the physical and motor capacities (Chissom, 1971). Simon (1959) evaluated the physical maturity of first-grade children and found from a battery of anthropometric indices that failing students tended to be less mature than successful students. In this study, body maturity proved a sensitive indicator of school readiness.

As suggested earlier neurophysiological readiness, including the ability to coordinate perceptual processes, is a variable frequently overlooked in evaluating school readiness. If a child appears to have no sensory deficiencies it is assumed that he can accomplish the usual school tasks. But the findings of Morency and Wepman (1973) indicate that the child who enters school perceptually unready will have difficulty in school achievement, and is not likely to catch up even after his perceptual processing ability is fully developed.

Morency and Wepman (1973) suggested that the full development of perceptual processing ability is usually reached by the age of 9. Before that time children learn by whatever perceptual pathways are open. In studying children's learning through perceptual pathways, McGeoch and Irion (1952) observed that relatively young children learned more effectively by auditory presentation than by visual. When Budoff and Quinlan (1964) tested these findings with 7- and 8-year-old children, they found that even at this age aural learning was more rapid and efficient than learning from visual materials. This is consistent with Rosner's findings (1973) that hearing appears to be more important than vision in learning to read. And it.is confirmed in many respects by the research and research reviews of Moore, Moon and Moore (1972), Moon and Moore (1975) and others.

When this perceptual readiness factor is disregarded, children may be subjected to the stress of remedial programs which are totally unnecessary and perhaps confusing. Ilg and Ames (1950) say that many so-called "reading disability" cases resulted from the attempt to force unready organisms to perform beyond the level for which they were prepared. And Frostig, Lefever and Whittlesey (1963) found a relationship between visual perception and reading disabilities that completely disappeared after age 10.

From the various aspects of readiness identified by these authors, the nature of school readiness may be summarized as including (1) a chronological age that permits the accumulation of some experience, (2) a cognitive ability which is able to attach meaning to experience, (3) a body of knowledge acquired through experience (including basic use of language), (4) physical development and anthropometric maturity, (5) perceptual discrimination, and (6) a readiness to read that emerges with the achievement of the other readiness factors.

Effect of social class on readiness. Since school readiness is partly a function of life experience, it might be suspected that many children from low socioeconomic levels are lacking in necessary experience when they fail to achieve in school programs. Support for this is found in studies examining the effects of preschool experience for disadvantaged children. For example, Bottrill (1967) found no difference in the school readiness of children from different socioeconomic levels when the disadvantaged had been provided day-nursery experience. Bottrill's report made it clear that the preschool environment was the factor that erased the difference in school readiness that usually exists.

Numerous studies show that disadvantaged children who have had preschool experience also have an increased ability to achieve in the first years of elementary school (Hodges & Spicker, 1967). Yet a closer look at other evidence indicates that disadvantaged children may not have been so lacking in experience *per se*, but only in experience with cultural variables to which formal school learning is related (Shriner & Daniloff, 1970; Beasley & Beasley, 1973).

The Beasleys measured the perceptual language performance of lower-SES black children and middle-SES white children. The middle-class children were more ready for this task in the first grade and performed significantly better than children from the lower socioeconomic level. But by the third grade this difference in readiness was not apparent. All third graders did better than first graders, but there were no differences between social classes when the results were averaged across grade levels. This study suggests that there is a larger perceptual handicap for younger children, regardless of social class.

There are apparently social class influences which determine the way a child functions as well as the way his experience-related intellectual abilities develop. Ames and August (1966) used the Lowenfeld Mosaic test, which is somewhat free of cultural influences, to compare black and white children from 5 to 10 years of age. With this instrument the responses of black children at 5 and 6 years were less mature than those of white children at the same ages. But after the age of 7 the discrepancy decreased so that the black children compared well with white children of the same socioeconomic level, and favorably with other white children.

The findings of Wei, Lavatelli, and Jones (1971) tend to support the narrowing of some differences between SES groups as age increases. They found that culturally-deprived children made slow progress on classification problems at the kindergarten level, although they were more successful with real objects than with abstract reasoning. But the range of difference between these children and those of middle SES became smaller at the second-grade level, narrowing with increased age.

Gross (1967) concluded from a study of middle-class Jewish children that cultural factors have a greater influence on children's school readiness than poverty and related disadvantages. The implication seems to be that the lack of readiness in children from particular SES or ethnic groups may be related to a particular way of functioning that becomes less of a handicap after the age of 7 or 8. Differences in performance between social classes may disappear by the third grade (approximately age 8) as in the Beasleys' (1973) study, or after age 7 as in the study by Ames and August (1966), and the forced elimination of differences a few years earlier may be pointless.

Directive highly-structured preschool programs seem to be more effective in producing cognitive gains in the most disadvantaged low SES children, while nondirective less structured preschool programs appear to be more effective with the least disadvantaged low SES children (Bissell, 1970). It appears that low SES children lack the resources to learn by themselves in unstructured programs (see also p. 211). Longitudinal research is needed to determine what real benefits, if any, accure over time from intervention designed for early school readiness.

School entrance age. Recognizing the importance of early education and the lack of it in many homes, concerned educators have hoped that flexible school entrance policies might remedy the situation. Experiments with early admission have yielded a wide range of results. In some instances school entrance at earlier ages than usual (i.e., before age 6) appears to have made no difference at all in achievement. Occasionally, with careful screening, younger children have seemed to gain an advantage by starting their academic career early. But the evidence strongly suggests that several months to a year or more of additional age throughout elementary school leads to real benefits for most children (King, 1955; Gott, 1963; Dickinson & Larson, 1963; Brown, 1973).

The conclusion of no significant difference in the achievement of children who entered school early and those who entered at regular ages was reported by Braga (1969, 1971), Spaulding and Katzenmeyer (1969), and McLeod, Markowsky and Leong (1972). There is some question, however, as to whether such reports mean that early entrants really achieved at the same academic level as their older classmates, or whether they performed equally as well in terms of expected achievement for mental age. If the latter were true early entrants would be at a disadvantage even though there were no differences in intellectual achievement measures. Although a difference in intellectual ability may not be apparent, entering school at a younger than usual age may have possible disadvantages in other aspects of life (Gaskill & Fox, 1964; Clarke & Drowatzky, 1972). Careful screening for social stability and physical maturity as well as intellectual ability is strongly recommended when considering such early admission (Hobson, 1948; Ahr, 1967b; Braga, 1971; Clarke & Drowatzky, 1972).

Worcester (1956) estimated that one year's acceleration of bright children would gain for our country 1,000,000 years of its best brains in a single generation. Worcester's statement might have some truth if it is assumed that these children were to proceed "lock step" through the elementary school, spending a year in each grade. Yet, while such a procedure has been held by many to be almost sacrosanct in American education,, it is hardly realistic in the light of children's varied abilities, experiences and rates of development.

This is not to deny the viability of acceleration under some circumstances. Much depends on when the students are accelerated and on when they start school. In a study of 300 individuals who started to school at about age 8 or later, all but four started at second or third grade or later (Moore, 1973). They quickly caught up with their classes and in most cases performed well above the class average. Many were accelerated, but all of these were considered mature for their ages and attributed their success to physical and perceptual readiness. The four who started at the first grade and were held lock step through all grades were the only students who had strong feelings against school. In each case they felt they were too old for their grades.

Choppin (1969) examined data from Husén's (1967) international study of 12 different countries, each with a distinctive educational system. On the basis of data in this report, Choppin proposed that school promotion should depend on the progress of the child and his readiness to join a new class. Schools, he suggested, should be prepared to accept new students on any Monday morning throughout the school year. And the time a child spent in any class or grade should depend on his individual needs and abilities. Thus a bright child could enter school at the regular age, or even later, and still "save" the years pointed out by Worcester. This has been urged for years by psychologists and psychiatrists on the basis of clear clinical experiences (Fisher and Hawley, 1951).

This same idea was suggested by Klausmeier (1963). He found that both learning efficiency and motivation were likely to increase when older, bright children were permitted to accelerate their progress rather than remaining with younger, less mature children.

In the absence of this freedom for children's developmental progress through school, careful screening for an early beginning has apparently produced positive effects for some children. The results of a 10-year study in Brookline, Massachusetts, indicated that carefully selected underage children were academically superior and had fewer social and emotional maladjustments than their older classmates (Hobson, 1948).

A more recent study in Skokie, Illinois, also yielded positive results for carefully screened early school entrants. Half of these early entrants were considered superior in intellectual performance and most of the others were average or above in relation to their older peers (Ahr, 1967b). Ahr concluded, however, that the major advantage in the screening policy for early admission was that it made possible the detection of problems in those children who were not ready for school. Through referral services problems could be prevented or treated before school entrance.

There are also disadvantages in early screening programs when the programs themselves are designed for early school entrance. Mawhinney (1964) reports the discontinuance, after 14 summers, of such testing and enrollment in one of Michigan's wealthiest public school districts, because of its doubtful value. An evaluation of the early entrants at the end of this period showed that nearly one third of the 4- to 5-year-old entrants were considered to be poorly adjusted, while three fourths were judged to be entirely lacking in leadership. One fourth were academically superior and another fourth were below average. Although the professional evaluation was as reliable as possible, there could be no evaluation of the child's effectiveness in his life situation other than that reported by his parents. In addition, the testing interview itself and the unreasoning negative reactions of parents whose children were not admitted may well affect the child's self-image and also affect the relationships between home and school. The costs, which were borne by the community, were highly disproportionate to the benefits achieved.

Apart from the issue of screening is that of the effect of early entrance on a child's general school progress. From Simmons' (1958) comparison of fourth graders' actual school performance and their probable performance had school entry been delayed, Green and Simmons (1962) hypothesized that delayed entrance would most likely result in greater achievement in any grade but in lower achievement at a given age. Again this would be true only if the rigid lock-step pattern of school progress were imposed. It need not occur if, as suggested by Anderson (1968), the school were designed to fit the individual child rather than trying to make the child fit the school.

Reading and emotional problems and some learning disabilities have also been attributed to early school entrance. Andreas (1972), who examined the records of 200 children with reference to school entrance age range, concluded that many of these problems were either created or made worse by plunging children into learning tasks inappropriate for their age.

Entering school early usually results in less than optimum achievement (King, 1955), while children who enter later are more likely to achieve at a higher level. Shields and Steiner (1973) found a greater variation in language skills between preschool children with a six-month difference in age than between socioeconomic levels in preschool groups. Similarly, Ilika (1969) found that even 7 or 8 additional months of age at the time of entrance to the first grade enabled children generally to achieve at a faster rate.

The few months' difference in age that makes the difference in learning is often determined by the time of year in which a child was born. Pidgeon (1965) confirmed what has commonly been observed by classroom teachers: that a child who was born at the "wrong end" of the year--whose birthday comes only a very short time before he enters school--is at a disadvantage compared to those who are slightly older. Unfortunately, as observed earlier, the lower achievement of these children tends to persist over the years. Bookbinder (1967) noted increased difficulty among slightly younger children in coping with ordinary classes at the age of 9 or 10. At this particular time, when the concept of conservation and logical thinking is becoming firmly established, those who have not yet acquired it often tend to lag behind their classmates.

During any given year there is often a chronological difference of 9 to 11 months or more between the youngest and oldest children in a kindergarten class or school grade. Gott (1963) tested children from the younger and older age extremes at the end of grades 2 through 6. On Stanford Achievement tests the older groups achieved more than the younger groups in all subjects at all grade levels, except for one zero difference.

This effect of entering school early goes even beyond grade 6, according to Forester (1955). A study of 500 pupils whose progress was followed from kindergarten through high school revealed that children who were very bright but very young when they entered school had varying difficulties from junior high on. They were reported as being physically immature and emotionally unstable. They did not do as well socially, behaviorally, academically or in leadership as those who were older at school entrance. Forester concluded that early entry could even have an adverse effect later in adult life.

The children who enter school younger are not intellectually deficient even though they achieve at lower levels and at slower rates. Using standardized tests, Shearer (1967) found that summer-born children were not at a disadvantage when age allowances were made. They were not lower in IQ, but for one thing teacher assessments of them were typically lower. Yet teachers expected them to accomplish the same as the slightly older children, even though they were not ready.

From a stratified random sampling of fourth graders Dickinson and Larson (1963) found more high IQ's among younger children, but these younger ones were less able to achieve than older fourth graders with lower IQ's. Brown's (1973) findings conveyed essentially the same message: When three groups of children (normal, bright and retarded) were matched for mental age, the older retarded children performed as well as normal children of equal mental age. The younger bright children did less well than their normal mental peers. These bright youngsters performed more like other children of their own chronological age. Brown observed that even though they were mentally advanced, they were held back by sheer lack of experience. And experience, as suggested earlier, is a prime factor in perception and conceptualization.

School entrance rationale. The age at which children are ready to begin a formal school program can evidently not be precisely fixed. Hobson (1948) and Ahr (1967b) found that with screening some children purportedly achieve early without trauma. There is substantial agreement among school entrance age researchers, however, that children who enter school later are significantly higher in academic achievement than those who enter early (Halliwell & Stein, 1964).

Current school entrance laws and regulations seldom seem to be based on the developmental needs of children. Anderson (1968) summed up the rationale of educators for starting school at age 6. By then educators were saying that children have acquired sufficient muscular control and language ability to begin reading. But Anderson questioned this assumption.

In reporting an Educational Testing Service study he noted that a committee of child development experts who assessed the areas of development necessary for school readiness considered sensorimotor, cognitive-intellectual and social-personal development of equal importance. Moral judgment and moral conduct were also included as readiness factors. But only 60 percent of a national sample of 7,000 children were found to be ready for school in all or most of these aspects, according to the judgment of their first-grade teachers. Anderson's conclusion suggests that it would be well to reassess school-entry ages and the purposes of early education.

Jensen (1969) observed a need for experimental programs that would actually delay formal instruction until readiness was achieved. Jensen surmised that school learning problems might thus be avoided, since forcing instruction on an unready child can result in the learning of skills with little transfer value or in the "turning off" of learning altogether. Fisher (1951) on the basis of such clinical experiences, strongly agrees.

There is little rationale for progressively lowering the school entrance age if later school achievement and performance in life are accepted as criteria of school success (Rohwer, 1971, 1975). From an analysis of research in this area, Rohwer questioned whether intellectual competence in early childhood, or even in elementary school, was necessary for competence in later years. He hypothesized that the longer formal instruction was delayed, up to certain limits, the higher would be the ultimate achievement. There are indications that formal schooling prior to adolescence should be radically changed with emphasis on the performance of skills rather than the retention of content. Such schooling would be expected to help children adapt to out-of-school tasks, to perform in life.

In evaluating federal programs involving compensatory education, Robinson (1973) reached a similar conclusion. Since the social environment strongly effects cognitive development, delaying academic learning until ages 10 to 14 would give the child the advantage of utilizing more fully developed cognitive skills. Research is needed to determine more definitely whether, as it appears, such programs would successfully reduce the frustration and anxiety of so much early learning and the apathy and low academic accomplishment of later school years. We can at this point find no systematic body of evidence to the contrary.

In one study, as noted earlier, nearly 300 individuals who entered school from two to five years later than the customary age of 6 or 7 have reported no difficulty in completing elementary school at the usual age or even younger.

It does not appear to be outstanding intelligence that enabled these people to achieve. And some could most certainly have been considered disadvantaged because of living in isolated areas or in other than their homelands. The common factor in all cases was later school entrance (Moore, 1973). Moore and Moore (1972) recommend ages 8 to 10 for beginning formal school instruction. They suggest normally starting the child with his chronological peers, pointing out that the late starters, usually without formal training before their first school enrollment, quickly catch up and often pass their more school-experienced peers academically. And they generally excel in behavior, sociality and leadership.

To remedy a lack of achievement in the schools, concerned educators and citizens have proposed lowering school entrance ages, suggesting that it would give children an advantage (Riles, 1972). Others have suggested revamping the curriculum to fit the laws of human development (Anderson, 1968; Rohwer, 1971). And Jensen (1969), Elkind (1970), Rohwer (1971, 1975), Moore and Moore (1972) and Robinson (1973) have examined the merits of delayed formal school instruction until the many aspects of readiness make it possible to learn with a rapidity and ease almost unknown in mass education today. Such delay would require greater flexibility in school entrance regulations than is now available in many states. Such flexibility should almost certainly be one of the most urgent subjects for policy reform at local, state and national levels.

## CHAPTER VIII

## AGE AND ACADEMIC STIMULATION

Synopsis: The young child's cognitive growth rates vary, with continuous changes in the nature and organization of mental abilities. Learning proceeds rapidly during at least two periods--the preschool years of 4 to 6 and the later childhood years of 9 to 11. However, there are maturational differences which determine what can be learned easily and well at these two stages. Primarily, the potential to learn is being acquired during the early years of life more than learning itself. The need for academic instruction at this stage is open to question since there is no conclusive evidence suggesting lasting effects of preschool instruction. Time provides an opportunity for the maturation of physical and mental abilities and also permits the accumulation of life experiences on which a child can build and give meaning to later academic tasks.

In the preschool years children tend to perceive things globally rather than analytically and are often confused in sorting out reality from fantasy. Then somewhere around age 7 a dramatic acceleration of cognitive growth begins and seems to continue for several years. This is consistent with Piaget's period of concrete operations in which a child normally develops consistency in abstract or cause-and-effect reasoning. At about the fourth grade or later, children achieve almost complete control of their own learning behavior, permitting considerable increase in the efficiency of cognitive production. This correlates with evidence which suggests that although some aspects of children's ability to make intersensory judgments are well-developed by school entrance age, full utilization is not reached until about the eleventh year.

Formal training in cognitive tasks during early childhood has been shown to improve intellectual functioning but such induced learning is likely to be limited in scope, to lack permanence and to be of little benefit to the child in later learning and achievement. In fact, earlier-than-usual learning may at times be detrimental to later learning. Specific training to solve problems does not generally become effective until about the fourth grade (or about age 9 or 10). It appears that a child's developmental level places a limit on what he really learns whether or not he receives instruction or training.

During the 7- to 11-year-old period the child is able and eager--if he has not been discouraged--to make rapid intellectual advancement. He displays almost complete mastery of common language structures and is capable of abstract thinking. It is this acquisition of abstract thinking ability that enables him to recognize and to organize and reason out concepts with facility. This ability begins to be used consistently at about age 7 or later.

Successful school achievement also appears to be related (1) to attitudes of the child which he develops through interaction with his family, (2) to the age when he enters school, and (3) to his general readiness for school. These factors are all highly correlated with chronological and mental age. Parents may damage rather than promote the personal development of their children by attaching excessive value to academic achievement and applying pressure on them to "grow up" and to achieve earlier.

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The conclusion that academic achievement potential increases with age has been commonly accepted by many researchers concerned with children's learning abilities at various ages (Bayley, 1956, 1970; Fowler, 1962). A look at the composite research picture reveals variable rates in cognitive growth with continuous changes in the nature and organization of mental abilities (Bayley, 1970).

There is apparently rapid acceleration in the development of intelligence in the early years (Bayley, 1956) with some stabilization of mental factors after ages 3 or 4 (Osborne & Lindsey, 1965; Bayley, 1970). Yet changes in cognitive structure and function continue to occur. Bayley (1956) found evidence that intelligence is still increasing at age 25. She also later (1970) observed that Bloom's (1964) widely-accepted definition of intelligence as a unitary mental property was inadequate because it had overlooked these continuous cognitive changes.

Bloom's conclusion that half the variance in adult intelligence can be accounted for by the age of 4 has led to much confusion in early childhood education. Unfortunately, it has often been interpreted to mean that 50% of a person's actual mature intelligence is developed by age 4, a conclusion which Jensen (1969) termed "unwarranted and fallacious." Whatever disagreement there may be over some of Jensen's assertions, his observation that compensatory early education does not produce lasting effects on children's IQ and achievement has strong support in research. Piaget's conception of intelligence for the preschool years, for example, agrees with Jensen's evaluation in this respect. Elkind (1969) who has often replicated Piagetian experiments, finds with Piaget that there is no support for formal preschool instruction nor for contrived stimulation of intrinsic motivation.

Elkind (1970) makes some further observations on Bloom's conclusions: According to Bloom's analysis, 80% of total growth in mental ability takes place by the age of 8, and as formal schooling progresses, the rate of mental growth declines. The years before school are particularly important because mental growth is cumulative and depends on what has gone before. But primarily the potential to learn is being acquired during these years, more than the learning itself. The need for academic instruction at this age is questioned since there is as yet no evidence for the lasting effects of preschool instruction. Elkind (1969) suggests that a delay of three or four years in formal schooling would enable a child to profit more from instruction because of more fully-developed mental abilities.

Palmer's (1966a) review agrees with Elkind (1970) that during the years between 4 and 6 (when the children's physical growth stabilizes for awhile) there is a period of rapid mental development which makes this period particularly important for learning readiness. And Bayley (1956) identifies yet another period of rapid intellectual development--ages 9 to 11. This later childhood spurt in mental growth has also been recognized in Piaget's theory of cognitive growth (Piaget, 1952) and in studies of perceptual and conceptual development (Elkind, 1961a, b, c; Milgram & Furth, 1967; Whiteman, 1967; Bigelow, 1971). If plasticity of intelligence is associated with a spurt in mental growth, there are at least two periods then when learning proceeds rapidly--the preschool ages of 4 to 6 and the later childhood years of 9 to 11. There are maturational differences, however, that determine what can be learned easily and well at these two stages (Piaget, 1952; Elkind, 1961a, b, c).

The tempo of cognitive growth. Achievement is a combination of effort, ability and experience. The quality of effort may be modified by interest or relevance, and the quality of ability by experience and practice. Experience can also generate interest, which gives it a role of especial significance in progress toward achievement. Harlen (1968) reviewed research spanning 40 years of investigation of the development of scientific concepts in young children and concluded that the impact of experience can profoundly affect the development of thought process, although it does not radically change the rate or order of their appearance.

Time, in relation to cognitive growth, provides an opportunity for the maturation of physical and mental abilities, but it also permits the accumulation of life experiences on which a child can build and give meaning to later academic tasks. Piaget (1964), whose theory of learning stages is closely linked to time spans, makes it clear that maturation alone is not sufficient if the full potential of a stage is to be realized. But this growth does play a vital part in the achievement of cognitive abilities. According to Piaget (1961), every new problem or experience provokes a disequilibrium which requires a new synthesis of previous knowledge and abilities. In the regaining of equilibrium, experience can add to both knowledge and ability but only to the extent that maturation permits assimilation of the experience.

Children in the preschool years tend to perceive things globally rather than analytically (Elkind, 1961a; L'Abate, 1962). There is a general inability to decenter, to comprehend the motives and feelings of others (Feigenbaum, Geiger & Crevoshay, 1970), and there is confusion in sorting out reality and fantasy (Taylor & Howell, 1973). While such findings are relatively common in child development research, these studies are reported here because they each found a definite, age-related progression of conceptual development toward a higher level as children moved out of the preschool years.

Bayley (1956) notes that between the ages of 5 and 7 there is a time of relatively stable and quiet mental activity. Then somewhere around the seventh birthday a dramatic acceleration of cognitive growth begins (Miller, 1968). This seems to continue for several years. This is consistent with Piaget's (1952) period of concrete operations in which a child develops consistency in abstract or cause-and-effect reasoning, and is able to understand and much more accurately appraise motives.

Bigelow (1971) found that children's perceptions proceed from global to less global (or more analytical) styles between the ages of 5 and 10. In perceiving figures independent of their field or background, elementary school children achieved a small average increase in perceptual performance from ages 5 to 7, but they showed a highly significant spurt ahead from ages 7 to 9 with the sharpest increase at age 8.

L'Abate (1962) tested Piaget's prediction of a relatively abrupt change from a global to an analytical approach to reality at age 7. Using a multiple-choice picture story to determine perceptual style, L'Abate tested children from kindergarten to grade 5. The results were interpreted as supporting Piaget's view of cognitive change at age 7. At that age the subjects began showing evidence of a quality of thinking or consistency of reasoning that was not apparent in younger subjects.

Whiteman (1967) also reported finding a cognitive change at approximately this same age. Children from two age levels, 5 to 6 years of age and 8 to 9 years of age, were interviewed to determine their conceptions of psychological causality in story situations. There was a highly significant difference between the older and the younger children in their comprehension of underlying motivation. The younger children relied on the overt feelings expressed in the stories while older children could perceive relationships and causes for behavior that were less obvious. The 5- and 6-year-olds were typically "intuitive" and the 8- and 9-year-olds were "concrete-operational" according to Piaget's definitions.

Consistent with these observations is Kendler's (1972) evidence that the ability to control behavior related to learning undergoes a change between the second and fourth grades. Kendler studied pupils at four developmental levels (kindergarten, second grade, fourth grade and college) to determine their ability to control learning behavior and to produce symbolic, i.e. abstract, responses to environmental events. The kindergarten and second grade groups showed a rapidly rising ability to control behavior but relatively little, if any, change in symbolic response production.

A change in the correlation between achievement and motor abilities has also been noticed at this particular stage of development. Chissom (1971) found that motor skills and coordination were significantly related to academic aptitude and achievement for first-grade boys but not for third-grade boys. This suggests that motor ability is more indicative of general maturation for younger children. Later, when motor development is less dominant and cognitive growth is in the ascendancy, motor skills became less of a criterion of developmental level. After the fourth grade, when the pupils achieve almost complete control of their own learning behavior, there is considerable increase in the efficiency of production of symbolic responses (Kendler, 1972).

While children are capable of mental tasks before the "dramatic acceleration of cognitive growth," noted by Miller (1968) beginning around age 7, until this transformation in cognitive functioning occurs they appear to learn with much more difficulty and at a slower rate. Milgram and Furth (1967) compared 6-year-olds and 9-year-olds who were expected to work with concepts in the presence of competing or distracting cues. Reciting formulas for their work as they proceeded helped somewhat, although the 6-year-olds did not profit as much from this as was expected. Nor were explanations and corrective feedback effective with 6-year-olds. Nine-year-olds, however, gave clear, consistent performances, regardless of the correction devices to which they were exposed. It had been predicted that 6-year-olds would profit more from these devices than the older children, but they could not effectively use such help no matter how much they needed it.

As already observed, the interaction of experience and maturation can modify to some extent the tempo of cognitive growth. But these modifications may merely map out different routes to the same objectives. They do not necessarily imply advantages for some and disadvantages for others. For example, in an attempt to measure intersensory communication (in this case, information perceived through seeing and manipulating objects), Conners, Schuette and Goldman (1967) compared children from low SES and upper-middle SES backgrounds at ages 5, 6, 9 and 12. At age 5 there were highly significant social class differences. The low SES children appeared definitely inferior in their perception. By the age of 6, children from both social class levels could communicate quite well a perceived shape, but not size and angle, after feeling an object which was out of sight.

In the perception of size and angle there was a gradual rise for low SES children up to the age of 9, and then a leveling off to the age of 12. There was an even more gradual rise for middle SES children up to the age of 12. At that time children from both social classes were again approximately equal in their perception, but the low SES children had achieved this ability several years sooner. The orientation of low SES children toward real, sensory-perceived objects rather than abstract reasoning (Wei, Lavatelli & Jones, 1971) may have made possible their more rapid rise in intersensory communication.

Birch and Lefford (1963) found that some aspects of children's ability to make intersensory judgments were well developed by school entrance age, but full utilization was not reached until the eleventh year. They noted that at each of three age levels between 5 and 11 years girls made significantly fewer errors than boys. The extent to which such differences and modifications in the progress of cognitive growth are due to psycho-social factors has not been determined, but cognitive growth does seem eventually to override cultural factors.

*Induced learning*. As children's learning abilities mature, the appropriate experiences for using these abilities are not always available. Thus the learning that occurs may be only minimal or far below what might be achieved.

This has been a major concern of those responsible for children's welfare.

There is evidence that training, within genetic or biological limits, can improve intellectual functioning (Bayley, 1966). But in summarizing the ultimate effects of programs designed to induce cognitive growth in early childhood, Bereiter (1967) maintains that there really is no answer to the question "How much can the intellectual development of young children be accelerated?" Bereiter says that children can be taught specific things, yet this tells us precisely nothing of their potential abilities.

Certain efforts to teach specific concepts and skills to children at a younger age than they would normally be expected to achieve such abilities have at times been successful. Children are not usually expected to perform the operations required in the logical solution of complex problems until later childhood or preadolescence, yet Engelmann (1967) gave preschoolers specific instruction and practice in the component skills and logical steps necessary to solve a problem. Although the disadvantaged children in the group never did grasp the problem, the advantaged children seemed to learn quickly. Engelmann concluded that the ability to handle such problems was a function of training rather than development.

Similarly with structured instruction Young (1969) was able to induce the learning of conservation concepts in 3- and 4-year-old children. Anderson (1965) also managed with bright first graders and with individual training sessions to induce rather complex problem-solving behavior. Towler (1968) gave 15-minute training sessions for conservation problems to 6- and 7-year-old children and found that they not only learned but also retained and transferred their knowledge. Brison (1966) experimented with 5- and 6-year-old kindergarteners to induce and accelerate the acquiring of the concept of conservation. With training, half of the subjects were able to understand conservation to some extent, and the induced concept appeared no different from that acquired "naturally." The children, however, found it difficult to cope adequately with the demands made of them; their cognitive structures were described as being in a state of disequilibrium.

These studies indicate that children can be trained to some extent to learn some concepts at an earlier age than is usually expected. Other studies, however, raise the question of the authenticity of such early training-induced learning. Even though learning does take place, it is very likely to be limited in scope (Deal, 1966; Stern, 1967), to lack permanence (Keister, 1941; Clarke, 1968; Bryant & Trabasso, 1971), and to be of little benefit to the child in total learning achievement (Beilin & Franklin, 1962; Keislar & Stern, 1970; Nelson & Earl, 1973; Willoughby, 1973). Shapiro and O'Brien (1970) caution that the apparent early attainment of such learning abilities cannot be taken for granted, and Bereiter (1967) questions whether the time and effort required to teach them can be justified. And much more research is needed to determine the results of early stimulation on later school life and adulthood.

The lack of permanence in earlier-than-usual learning may at times be a detriment to later learning. Keister (1941) found that three groups of children who learned to read before they reached a mental age of 6 made normal progress during their first year. But their reading skill tended to disappear during the summer months between grades one and two. This loss was not made up in succeeding years. The children were permanently retarded in reading after the beginning of the second grade.

Clarke (1968) attributes a lack of permanence in early learning to a lack of continuous reinforcement or enduring experience. He suggests that it is not so much age or the intensity of training as it is the subsequent, consistent and persistent exposure to reinforcing experiences that gives any permanence to early learning. At later ages learning seems to be retained without this constant repetition.

With situations structured to produce specific learnings, even though limited, and the reinforcement necessary to maintain learning, educators have hoped it would be possible to increase children's learning achievements. But without adequate experience and cognitive consistency children have often been unable to use the information they have been trained to produce.

Willoughby (1973) found that special training for two different methods of solving problems involving choices was not really effective until the fourth grade. Kindergarteners with training performed no better than a control group without training. Second graders benefited by training for one of the methods but not the other. In this study it appeared that the manner of presenting stimuli determined the level of performance, but the ability to use information gained through training was a function of increasing age.

This same functional relationship appeared in the findings of Keislar and Stern (1970). In this study mental age was a significant variable in second and third grade children's effective use of problem-solving strategies. Children in the highest mental-age group were superior when taught a complex strategy. But those with a lower mental age performed better when taught a simple strategy. They lacked the ability to use the more complex strategy effectively, even when carefully taught to do so.

Nelson and Earl (1973) likewise found that preschool children could be induced to acquire abilities, but they lacked the skill to relate these abilities spontaneously to routine learning tasks. In training trials for using category questions to get information, the children seemed to accomplish a task with greater speed, but later testing showed they were no more efficient than children in a control group with no training. They pointed out that the skills which a child learns must be matched to his available conceptual abilities if there is to be a substantial development change in cognitive performance.

Regardless of training or experience, a child's developmental level places a limit on what he really *learns*, whether or not he receives instruction and training (Beilin & Franklin, 1962). They found that in the achievement of the ability to measure length and area, third graders received greater benefit from training and instruction than first graders. With third graders the influence of training and instruction was minimal only in areas where few gains were possible because concepts were already in operation. But no first grader, even with training and instruction, was able to measure area. The ability to profit from instruction and training in developing the concept of measurement correlated with the developmental level of the child, and supported the proposal of Piaget, Inhelder and Szeminska (1960) that development limits that which may be acquired by virtue of experience or training.

The three-year study of Almy et al. (1969) to test the progress of early training in logical thinking, achieved divergent results. Systematic instruction in the basic concepts of math and science were begun in kindergarten for one group of children, in first grade for another group, and in second grade for a third group. Some have conjectured that the groups may not have been comparable in all respects, for children whose prescribed lessons began in the second grade performed about as well as those who had been having lessons since kindergarten, and those whose lessons began in the first grade gave the poorest performance. Yet the second graders who were being instructed in these concepts for the first time may have been approaching an age when they could receive greater benefit from instruction, and thus learned the concepts more rapidly. Those whose instructions began in kindergarten might have done equally well because of reinforcement over a three-year period.

This difficulty that children have in using what they learn in the preschool and early elementary school years is indicative of their mode of thinking. According to Ausubel (1962) elementary school children think intuitively about abstract ideas. This is characteristic of them until early adolescence. Ausubel further asserts that the argument that younger learners achieve intellectual skills more easily than older ones has not been validated. Program structure and continuity, and diligent effort can induce early learning skills. These skills, however, are generally not used productively until several years later.

*Expanding cognitive abilities*. As the tempo of cognitive growth moves into the 7- and 11-year-old period described by Piaget (1952) as concrete-operational, the child finds himself able (and eager, if he has not been discouraged) to perform new mental operations with the concepts and symbols which he has been accumulating during the early childhood years. While specific training or instruction may have induced some intellectual skills relatively early, the ability to reason or think consistently, to perceive relationships and to make logical choices appears to be a function of this later development (Phillips, 1969).

Even verbal ability in a native language, which arises spontaneously in normal child-adult communication and may be induced in a structured environment, cannot be forced beyond certain cognitive limits of comprehension. Basic language structures are by no means mastered by the age of 5 or 6 as has been commonly supposed (Chomsky, 1972; Palermo & Molfese, 1972). Chomsky (1972) found a surprisingly late acquisition of understanding of sentence structures. The active mastery of common structures was taking place up to the age of 9, and perhaps even beyond.

Overall cognitive development is interrelated with the ability to recognize and organize the components of language (sounds, word meanings, etc.) for communication, and there is a gradual consolidation of language structures from kindergarten up to the seventh grade. Abrupt shifts in verbal performance have been noted between kindergarten and first grade and again between grades 5 and 7 (Palermo & Molfese, 1972), but the phonological system has apparently not been completely mastered until this later stage.

These findings tend to concur with Hall (1969) who found that children's ability to recognize and discriminate between word meanings increases with age with a near-perfect performance in the fourth grade. And Brook (1970) found that children's ability to recognize the origins and arbitrary value of names continues to increase as late as age 10.

In comparing the difference between relatively "primitive" serial or rote learning and paired associate learning, Jensen and Rohwer (1965) observed a very steep gradient for paired associate learning between the ages of 7 and 13. With kindergartners there was very little effective learning by association, but as verbal experience enriched the associative network and more verbal mediators became available, such learning increased rapidly. Jensen and Rohwer also noted a correlation between paired associate learning and mental age. The rise in serial learning, on the other hand, was gradual with younger children and almost nonexistent after the fourth grade (age 9). Serial learning was correlated with IQ, but did not require the cognitive development necessary for learning by association.

A similar sequence in learning was found by Williams (1971) in testing children's attainment of the concept of number. In kindergarten children could recognize symbols for a number, but number operations such as addition and subtraction were evidently beyond their ability. The recognition of words and numbers is a common preschool accomplishment, but the ability to use these symbols in relation to each other depends on cognitive structures that continue to develop throughout the childhood years.

When O'Brien and Shapiro (1968) tested the development of logical thinking, they noted the expansion of cognitive abilities and concluded that hypothetical-deductive thinking cannot be assumed until after age 8. Between the ages of 6 and 8 children were quite successful in recognizing logical conclusions. They could identify such conclusions but apparently could not understand why they were necessary. The difficulty with abstract thinking prior to this age is also seen in relation to causality (King, 1971), the concept of time (McAulay, 1961), the use of problem-solving strategies (Odom, 1967) and the making of choices or decisions (Birch & Bortner, 1966; Lewis, 1966).

Such a common achievement as differentiating right and left affects the formation of abstract relational concepts, according to Elkind (1961d) who tested children aged 5 to 11 for right-left discrimination. In Elkind's study children made no distinction in their concept of right and left before age 7 or 8, and full differentiation was not reached until age 10 or 11. Elkind concluded that the attainment of this abstract concept of discrimination was a developmental measure of cognitive ability. Furth's (1963) analysis of data from a nonverbal, part-whole discrimination task shows a similar increase in ability to discriminate with a marked decrease in errors at age 10.

This is also interesting in view of Metcalf's (1975) findings that the young child's brain does not lateralize before age 8 or 9. In other words, cerebral dominance--laterality--appears age wise to coincide with Elkind's and Furth's findings on discrimination.

It is the acquisition of abstract thinking ability, of course, that enables a child to recognize and use conservation concepts. In most cultures, for the schooled as well as the unschooled, this begins to occur consistently at about age 7 (Goodnow, 1968). There is, however, some evidence that it appears later in cultures where explicit definitions for everyday occurrences are lacking, as with the Wolof bush people's tendency to explain changes by "action-magic" (Greenfield, 1966). In this African culture school children were 11 or 12 years old before they acquired conservation, and only about half of the unschooled could grasp the concept. The ability to make appropriate explanations contributes to the development of this concept (Peisach & Wein, 1970), and the Wolof's magic-orientation placed limitations upon them.

Such delayed acquisition of conservation emphasizes the impact of experience on conservation-type reasoning, but

Keasey and Charles (1967) make it clear that experience is not a sufficient factor. A certain level of mental functioning must also be reached before a child can perform these logical operations. For both normal and retarded children, Keasey and Charles found that experience was no advantage without a requisite mental age.

Strauss and Langer (1970) sought to induce operational thought and assessed the conservation concepts of 5- and 6-year-old children both with and without training. They found a greater trend toward conservation among the older children whether or not they received the training. Whether experience has been acquired in routine activities or in special training, the level of mental development at the time of the experience determines the ease with which conservation can be acquired.

Achieving success in school. Success in school is commonly associated with the ability to assimilate and use an organized body of knowledge, much of it abstract or academic in nature. Miller (1970) identified eight factors in primary school children that were correlated with school success. Six contributed to achievement and two detracted from it. All factors were related in some way to the child's adjustment in family interaction. Children who achieved most successfully tended to like school, had a desire for an education, and sensed a use for school learning in the demands of some future job. They also had acquired confidence in themselves, felt free to think and to act, and perceived their parents as supportive though not indulgent. Feelings of parental dominance or of deprivation led to a lack of achievement.

While many attitudes toward school undoubtedly originate within the family, an international study of mathematics achievement (Husén, 1967) suggests that these attitudes are also related to the age at which a child enters school. For children from 12 nations (Finland, Germany, Japan, Sweden, Belgium, France, Israel, Netherlands, Australia, England, Scotland, and the United States) information was obtained regarding performance in mathematics at age 13, attitude toward school, and age of school entry.

Austin (1972) commented on the implications of this study and noted that school experience at age 5 had little effect on later mathematical ability but might be somewhat beneficial. School experience at age 6 was thought to be rather important and the lack of it at age 7 was termed detrimental. Rohwer's (1971) ranking of the correlations in this study, however, showed that these effects noted by Austin were not statistically significant. What was significant was a strong negative correlation between school entry age and attitude toward school. Additional years in school did not contribute significantly to average performance in mathematics; but the earlier children had started to school, the more negative were their attitudes toward school.

Huberty and Swan (1974) found that predictors of successful achievement in the first grade were different for children who had had three years of preschool experience and for those who had had no preschool. Without the early education experience, first grade success depended on general readiness factors (physical and social maturity, age-related experience, etc.). Several years of preschool experience affected behavior variables so that such things as aggressiveness, cooperation, attentiveness and communication became predictive of success in most verbal areas. Readiness, however, was still the most important factor for success in arithmetic and in understanding paragraph meaning.

Positive effects of preschool and kindergarten experience have been noted in helping children to overcome weaknesses in specific skills (motor, visual, auditory-language). According to Coffman and Dunlap (1967), children who attended nursery school or prekindergarten made greater gains in these skills than those who were not in school, even when programs were not specifically structured for skill development. No follow-up evidence was provided, however, for the children in their school years.

A number of studies (King, 1955; Baer, 1958; Gott, 1963; Halliwell & Stein, 1964; DeWitt, 1961; Feyberg, 1966; Arena, 1970) indicate that age, both chronological and mental, has a close relationship to success in school. Mental age is the greater influence on achievement (Feyberg, 1966), but the younger a child is when he starts to school, the more chronological age appears to affect his progress throughout his school life (Forester, 1955). King (1955) reports that children who entered the first grade before they were 6 years old failed to realize their optimum academic achievement. Cumulative records over a period of six years revealed a continued disadvantage for them, even though as a group they had a slightly higher IQ than those who entered school from six to nine months later. Children in this younger group were also more likely to repeat a grade.

Conclusions similar to King's were reached by Halliwell and Stein (1964) when they calculated the mean IQ and achievement scores in relation to chronological age for fourth graders. From their results they hypothesized that the age-effect on achievement would approach zero as tests became less reading oriented, and this was partially supported.

Arena (1970) found that mental maturity was not only associated with academic achievement, but it accounted for 55% of the total variance in achievement. And Feyberg's (1966) results showed that successful school achievement in areas requiring the use of concepts, such as numbers, classes, and spatial and causal relationships, were highly correlated with mental age. The development of these concepts was especially associated with success in arithmetic, problem-solving and spelling.

As a society we attach great value to academic behavior. Parents rate themselves as parents by the school achievement of their children. And children strive to achieve, not for the sake of learning but for the approval and recognition of parents and teachers. Strom (1965) observed that the excessive value attached to academic achievement and the pressures to grow up and achieve earlier could be damaging to personal development. Strom suggests that families who want the very best for their children are often unaware of the frustration of early education--the challenges that are too great, too physically taxing, and the personal relationships based on adult approval rather than on firmly established emotional bases. Strom placed in perspective the consideration of achievement in relation to age when he observed that the only path to maturity is by way of childhood; that is, the future citizen must be a boy before he is a man.

# CHAPTER IX

# SEX-DIFFERENCE EFFECTS

Synopsis. The development of sex differences in gender roles and behavior patterns of young children appears to be the result of complex interactions among genetic, hormonal and environmental factors (including psycho-social effects). By the age of 3 children are usually aware of the expectations associated with their sex in their culture. These sex differences are in fact a function of the socializing process and of the environment in which it occurs. Although the expectations are not the same in all cultures, males are generally expected to perform tasks demanding physical strength, to achieve and to be self-reliant; while females are expected to be nurturant and trained in home responsibilities.

Physically, boys are about four weeks behind girls in skeletal maturity at birth and often nearly a year behind by school age. This generally increases to approximately eighteen months at 9 years of age and two years during adolescence. Normally there are no significant intellectual differences in the inherent abilities of boys and girls, but physically and emotionally young boys are more vulnerable to the environmental hazards of home and school, and this may affect their mental growth. However, as they grow older this vulnerability diminishes, and during primary school girls appear to be more dependent on and more greatly influenced by their parents and other adults.

Generally girls in the western world acquire language, motor and perceptual skills earlier than boys and they can acquire these skills with maturation and out-of-school experience. Because of slower physical maturation rates, greater emotional vulnerability, less realistic cultural expectations and psycho-social interactions in the early years, boys are more likely than girls to experience learning and behavior problems. Allowances are seldom made for the limitations of boys in early learning situations, so their abilities are frequently masked by aggression, negativism and low teacher ratings. Findings that boys are more negatively affected by early school entry than girls are therefore not surprising. However, when boys are given an opportunity to mature until about 8 to 10 years of age before starting school, they usually do as well as girls.

In western societies, entrace age laws which require boys and girls to enter school at the same time are seldom specifically framed in the interests of little children, particularly little boys. Such legislation should be flexible enough to accommodate the young child's developmental needs and abilities, including the later maturity of young boys.

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The earliest observable differences in the behavior of boys and girls are apparently of biochemical origin (Hamburg & Lunde, 1966). Yet usually some form of cultural shaping is also initiated almost immediately after birth, setting the stage for gender-determined responses to the neonate. The subsequent development of sex differences appears to be the result of complex interactions among genetic, hormonal and environmental factors.

That sex differences may be due in part to environmental factors is borne out by the Stanford CAI (Computer-Assisted Instruction) Project. It is commonly accepted that in Western societies girls generally do better than boys in reading, yet there was no difference between first-grade boys and girls in rate of progress and accuracy of performance (Atkinson, 1968). Evaluation of the program after seven years showed that both boys and girls benefited from computer-assisted instruction--with less than usual teacher influence--but that it was relatively more effective for the boys (Atkinson & Fletcher, 1972; Fletcher & Atkinson, 1972).

It is often difficult to determine whether some sex differences are the result of biological predisposition or of psychosocial reinforcement of maleness or femaleness. Sex differences in the behavior of human newborns, however, appear to be of biological origin since environmental factors are minimal at birth. Several examples of such early differences in behavior have been observed. For instance, Bell and Darling (1965) found that newborn males gave evidence of greater muscular strength than females in their ability to raise their heads higher. And female infants seemed to be more sensitive to skin exposure and more responsive to tactile stimulation than males (Bell & Costello, 1964; Weller & Bell, 1965). This was still true at the age of 2 or 3 months (Wolff, 1965).

These neonatal behaviors begin to interact very soon with environmental factors and exert a definite influence on the development of further sex differences. Moss (1967) found that as early as 3 weeks of age infants were shaping their own environment to some extent by the behavior they elicited from their mothers through crying and other demands for attention. He reported that male babies at this early age were less easily soothed than females, and an interaction pattern was established accordingly. The common assumption that boys are more difficult to socialize than girls could very well be true because of basic differences in the biological and temperamental natures of children and adults and the resulting interaction effects.

A possible source of sex differences in neonatal behavior has been suggested by Hamburg and Lunde (1966) who concluded that there was probably some effect of androgenic hormones upon the developing central nervous system during prenatal development. Postnatally, there is not only biochemical but also neurophysiological and behavioral evidence that sex hormones, especially progesterone, enter the brain and affect its activity (Hamburg, 1966). Hamburg and Lunde (1966) have proposed that the sex differences apparent in the behavior of early infancy might ultimately affect (1) the orientation of an infant to his environment, (2) his readiness for learning experiences, and (3) his relationship with other people.

_Some characteristics of gender roles_. While hormonal chemistry may initially give rise to particular behaviors which generate responses appropriate to "boy" or "girl," the child's learning of a sex role, and the behavior related to it, appears to be quite independent of his biochemical functioning (Money, 1961; Hampson & Hampson, 1961). The expectations associated with the male or female gender are determined by cultural and environmental conditions (D'Andrade, 1966), and are learned during the first few years of life (Hamburg & Lunde, 1966). It is suggested that the critical period for learning a gender role is roughly between 18 months and 3 years of age (Hampson, 1955; Money, Hampson & Hampson, 1957; Money, 1961).

An American study by the Joint Commission on Mental Health of Children (1973) indicated that sex differences are in part a function of the socializing process and of the environment in which it occurs. The trends of the times, the values of various subcultures and the psychological climate of schools or other learning environments are largely responsible for the specific sex alignment of such behaviors as aggression, conformity, etc.

Although the specific tasks assigned to the sexes may vary from culture to culture, there is a general tendency to expect males to perform those tasks demanding the most physical strength. In a study of 110 primarily nonliterate cultures, Barry, Bacon and Child (1957) found that boys were under greater pressure to achieve in 87% of the cultures and to be self-reliant in 85%. Girls, on the other hand, were expected to be more nurturant in 82% of the cultures and more trained in responsibilities in 61% of them.

A cross-cultural analysis of sex differences in six cultures (Whiting & Edwards, 1973) suggested universal sex differences in the behavior of children age 3 through 11. The differences within some cultures, however, were not as great as those found between the sexes in the United States and Western Europe. In certain East African societies where boys took care of infants and assisted with domestic chores, there appeared to be fewer sex differences between the boys and girls. The boys were less egoistically dominant, less aggressive and less attention-seeking than in societies where more "masculine" behavior was expected. It was believed there was less pressure on these East African boys to "prove" themselves in more aggressive ways.

Whiting and Edwards also reported that in a New England community where girls had very little contact with infants and were assigned less "feminine" work, the differences in the behavior of boys and girls were not as great as in other American societies. The nature of the tasks assigned to children seems to be among the best predictors of the gender-role behavior.

Pressures on boys to achieve and to be self-reliant are by no means limited to nonliterate cultures. In the United States, Bledsoe (1967) studied fourth and sixth grade boys and girls in Georgia and found that achievement was significantly related to self-esteem for boys but not for girls. Achievement is evidently such an integral part of the male role that without it male self-esteem deteriorates (Flammer, 1971).

These pressures exist even in the early preschool years, according to Tyler, Rafferty and Tyler (1962). In their study of children in a college campus nursery school, boys were expected to be more independent than girls. The later physical developmental age of boys (Tanner, 1961), coupled with cultural sex-role pressures, suggests possible explanations for some of the vulnerability apparent in the male role in early childhood.

Boys' problems seem especially difficult in literate cultures where achievement depends largely on school-related tasks (Maccoby, 1966; Mannio, 1966). Data from 525 mental health clinics in 24 states (Rosen, Bahn, & Kramer, 1964) indicated that more than twice as many boys than girls were brought to these clinics. The need of boys for such psychiatric help during the elementary school years reached a peak around the fourth grade.

The very real discrepancy between gender-role expectations held for boys and their ability to achieve suggests that in those societies where they trail girls in the maturation process schooling practices may be adding to their difficulties. And since achievement is not so crucial for girls and they are often more advanced for their ages developmentally, they have fewer school-related problems in early childhood.

Sex differences in physical maturation. Skeletal growth is commonly considered one of the most reliable indicators of maturity, more so, for example, than chronological age (Flory, 1936). In physical development, sex differences are found even before birth in the rate of skeletal growth, and later differences occur in permanent dentition rate (Tanner, 1961). Tanner noted a curious lack of difference between boys and girls in primary dentition, but in skeletal age he found boys approximately four weeks behind girls at birth, and until adulthood the skeletal age of boys remained about 80% that of girls. At the average age of school entry girls were found to be approximately a year ahead of boys in skeletal maturity according to an assessment using the osseous development of the hand, including the wrist, (the carpals, metacarpals and phylanges) as an index (Flory, 1936). Flory notes that for some years males continue to widen this gap and do not catch up with females in this respect, i.e., maturity of bone structure, until about age 19. In fact, by age 9 boys lag 1½ years behind girls, and they extend this maturity difference to approximately two years during adolescence.

From birth girls also appear to be more robust. The data indicate that fewer girls suffer brain damage at birth, and they have more resistance to disease in early childhood (Donaldson & Kohl, 1965; Dublin, 1965; Washburn, Medearis & Childs, 1965). Jersild (1968) concluded that boys, when compared with girls, have more congenital defects, are more physically and emotionally vulnerable, suffer greater damage from malnutrition and disease, and have a shorter life expectancy.

In spite of the differences in skeletal maturation, however, Garai and Scheinfeld (1968) found no significant sex differences in motor skills when boys and girls were given equal training, equipment and encouragement and provided opportunity for practice. Although motor skill differences in the sexes appeared at kindergarten age, they seemed to be primarily results of cultural pressures.

An important development in physical maturation is the sudden increase of hormonal activity that occurs for both boys and girls about the same time as the maturation of perceptual processes at age 8 to 10 (Nathanson, Towne & Aub, 1941; Tanner, 1962). It is not yet possible to say how hormonal activity relates to the expanding cognitive abilities of this age, but Brenner and Stott (1973) consider it a reliable indicator of development, including that of the brain and nervous system.

For both sexes Tanner (1962) noted negligible amounts of androgenic hormones up to age 8 or 10. Then a sharp increase occurred, with boys reaching a level of absolute values about twice that of girls. Similarly, Nathanson, Towne and Aub (1941) observed very low levels of estrogenic activity in both sexes until age 8 or 9. After that estrogenic activity increased for the girls, accelerating around age 11. These concurrent developments of increased hormonal activity and increased perceptual and cognitive abilities in later childhood present a situation that deserves exploration.

Sex differences in affective relationships. The emotional climate of early childhood is usually related to parent-child interaction, and sex differences are highly evident. Boys seem to need greater maternal warmth and protectiveness during their first few years while girls indicate an earlier need for a certain amount of freedom to explore (Moss & Kagan, 1958; Bayley & Schaefer, 1964). Bayley and Schaefer suggested that girls possess a measure of genetic control in intellectual performance, while boys are more responsive to their environment and particularly to interaction with their parents. Bayley (1970) concluded that for mental growth boys were more dependent than girls on the emotional climate.

As development progresses, however, boys become more emotionally secure. Moss and Kagan (1958) found that the positive effect of maternal encouragement and concern on the intellectual development of boys diminished from age 3 to 6. And by the age of 8 to 11 the concern of their mothers affected the achievement of boys in only a small way (Eklund, 1970). By then their achievement was apparently more related to the culturally assigned independence of the male role.

Sex differences in first-grade children were observed in relation to contact with parents and the desire to do well on a task (Grossman, 1969). Girls who had a close and affectionate relationship with their parents were anxious to do well, but not so for boys. Boys who had a similar quality of parent contact responded at a lower rate.

Among primary school children, relationships between their academic performance and the attitudes and behaviors of their parents have revealed further sex differences (Crandall et al., 1964; Katkovsky, Preston & Crandall, 1964a, 1964b). The reactions of these parents to their children's achievement in grades one and three were found to be significant, but for daughters only. As in the studies by Moss and Kagan (1958) and Eklund (1970), the academic performance of boys at this age was independent of parental behavior. There is some evidence, however, that earlier parent-child interactions influence boys' behavior in these primary school years (Bayley & Schaefer, 1964).

Boys may be more dependent in the first few years of life (Levy & Tulchin, 1925; Bayley, 1970), but by preschool age there is little difference between boys and girls on this measure (Crandall & Rabson, 1960; Tyler, Rafferty & Tyler, 1962; Kohlberg & Zigler, 1967). From school age on, however, girls appear more dependent than boys (Crandall & Rabson, 1960; Beller & Neubauer, 1963), perhaps, as suggested by Mischel (1966), because of the greater permissiveness in our culture toward female dependency.

School-age girls have also been found to be more greatly influenced than boys in acquiring moral concepts from their mothers (Edwards, 1974), and conforming to adult standards in moral development (Devereau, 1970). While parents do have an influence on the moral development of boys, it seems less evident than with girls. Devereau concluded that inadequate parenting produced in boys a peer conformity with such traits as irresponsibility, childishness, anxiety and resistance to authority.

The exploration of sex differences in parent-child interaction also shows some correlation between sex of parent and the development of verbal and math abilities. But since the variable of independence or self-reliance is also involved here, the sex of parent may be only an indirect influence. Carlsmith (1964) investigated the effects of father-absence during World War II on children from intact families. Father-absence was consistently related to differences between mathematical and verbal abilities. The longer the father was absent and the younger the child during the absence, the greater the relative superiority of verbal to mathematical aptitude. This effect was greatest for children whose fathers were absent at birth or were away for longer than 30 months. There was a relative increase in mathematical ability when the father's absence was brief or occurred later in the child's life.

Bing (1963) explains this phenomenon thus: The development of number ability requires independent concentration and ability to carry through a task by oneself. Early verbal ability, on the other hand, is generally fostered by close relationship with a demanding and somewhat intrusive mother.

It may be that Carlsmith's results are a reflection of this intrusive mother behavior which might increase in the father's absence. But whether these effects are dependent upon differences in parental expectations, the developmental maturity of boys and girls, or some other factor has not been determined.

Child-adult interactions can of course extend to include adults out of the home as well as parents. Even for very young children there are sex differences in response to nonfamily adults. As early as age 2, boys have appeared to be more aggressive toward adults other than parents, while girls were more compliant with adult demands and initiated more interactions with their teachers (Sigel et al., 1972).

The variables of sex are very complex, for not only does the sex of the teacher affect the child's behavior, but the sex of the child also appears to affect teacher attitudes. Lee and Wolinsky (1973) noted differences in children's self-concept development as a possible result of the effects of male and female teachers in early school experiences. Feshbach (1969) found that student teachers tended to respond to boys and girls according to preferences they considered appropriate for each sex. And Brenner and Stott (1973) observed dynamic interaction patterns between female teachers and boys that produced lower teacher ratings for the boys. Teachers have also appeared more threatening in the preschool to boys than to girls (Formaneck & Woog, 1971). The predominance of female teachers interacting with the expected aggression of boys produces different behavior patterns for boys and girls with apparently far-reaching effects.

In early schooling the sex of a child has proved to be an important monitor of the effect the school experience will have (Beller, 1974). Mason and Prater (1966) recommended separate reading instruction for boys and girls because of the psychosocial effects of reading instruction at the kindergarten level. In this particular instance, boys' behavior was significantly changed in a negative direction by reading instruction. Boys and girls do not seem to differ significantly in nonverbal cognitive abilities (Furth, 1963; Brenner & Stott, 1973), but rather in certain skills such as verbal (Bayley, 1970; Reilly, 1971) and analytic abilities (Witkin et al., 1954; Kagan, Moss & Sigel, 1963) which appear to be influenced, in part at least, by psychosocial factors. The sex differences found by Brenner and Stott (1973) indicated that in kindergarten and first grade the boys may be more ready for problem solving and risk taking, but girls usually achieve better where traditional learning-obeying-conforming attitudes are required.

Sex differences in school readiness. Even when boys and girls are very similar in IQ, social class, school readiness and perceptual measures, they still show a difference between the sexes in early reading achievement, with the girls giving evidence of superior average reading ability over the boys (Rosen & Ohnmacht, 1968). The girls' advantage may be due to earlier stabilization of verbal ability (Bayley, 1970; Maccoby, 1966), earlier mastery of vocabulary and reading comprehension, and earlier integration of audio and visual skills (Reilly, 1971). Boys seem to have more difficulty with visual perception in their attempts to read (Coleman, 1968).

Carroll (1963) and Hall (1963) also observed reading problems in boys. Carroll's data suggested that this was especially true for younger children. And Hall found that boys not only achieved at a lower level than girls, but three times as many boys as girls were retained among the children who were underage at the time of entrance to first grade. It was recommended that beginning instruction in language arts and reading be postponed, especially for boys. Or, Hall concluded, if school achievement standards remained rigid, then the entrance age of boys should be delayed from six months to a year.

The same pattern appears in studies of boys and girls below elementary school age. Sex differences in school readiness resulting from kindergarten attendance were compared with the effects of a year of maturation and incidental out-of-school learning experiences for boys and girls of the same chronological age (Rubin, 1972). The effects of kindergarten attendance were negligible for the girls. Maturation and out-of-school learning had increased their readiness skills as much as kindergarten activities. The boys, however, did appear to show some benefit from kindergarten.

Rubin concluded that the girls had already passed the stage for developing the readiness skills measured, so kindergarten had little effect on them. But the boys, who matured more slowly, were developing these skills in their kindergarten year. The boys who were exposed to kindergarten activities developed readiness skills in language, numbers, visual decoding and copying to a greater degree than boys who remained at home. Since the girls appeared to develop most of these skills prior to kindergarten attendance, a further comparison is needed to determine whether the boys would reach the same level of readiness if time were allowed for sufficient maturation and out-of-school experiences to accommodate the apparent lag in the development of boys.

Rubin's findings are supported by Coffman and Dunlap (1967) and by Marshall P. Smith (1968). These earlier studies involved prekindergarten children at an age slightly younger than Rubin's kindergarteners. At this younger age girls were better able than boys to profit from training in motor, visual and auditory-language skills (Coffman & Dunlap) and in intellectual performance (Smith). Smith supposed that these differences between boys and girls were most likely a function of greater psycho-social readiness in girls.

Generally in the western world girls acquire language, motor and perceptual skills from several months to a year earlier than boys, and they can acquire these skills with maturation and out-of-school experience. The differences in the school readiness of boys and girls, however, involve much more than a mere differential in time for a single aspect of development (Brenner & Stott, 1973; Rubin, 1972).

Effects of early learning and school success. Certain aspects of intellectual development cannot occur until the relevant physical structures are complete (Maccoby, 1966). Since girls mature physically earlier than boys (Tanner, 1961) and stabilize their verbal skills sooner (Bayley, 1970), they seem to possess an advantage in learning. Girls also acquire an IQ similar to that of their natural parents earlier than do boys (Honzik, 1957; Moss & Kagan, 1958; Bayley & Schaefer, 1964). But by the age of 6 the correlations between parent and child IQ are similar for both boys and girls (Moss & Kagan, 1958), and there are almost no sex differences in IQ during the school years (Gardner & Moriarty, 1968).

It may be for reasons inherent in physical differences and developmental rates of the sexes that school entry-age studies have so often found boys more negatively affected by early entry than girls (King, 1955; Carter, 1956; DeWitt, 1961), or have found boys more likely to repeat a grade, especially in primary school (King, 1955; Hall, 1963; Mannio, 1966). It may be these sex differences in development, plus premature expectations of performance for boys (Bentzen, 1963), that account for the facts that 70% of all children in special education are boys (Mumpower, 1970), and boys are involved in a greater number of behavior problems (Cutts & Moseley, 1957).

Maturational factors appear to have strong influences on learning and school success, and the sexes usually do equally well when children have reached about 8 to 10 and have matured neurophysiologically, visually, auditorially, etc. (Moore, Moon & Moore, 1972; Moore and Moon, 1975). By the age of 6, sex differences in vocabulary have largely disappeared, and by age 10 boys have caught up with girls in reading skills (Maccoby, 1966). Sometimes boys have even forged ahead of girls at the 8- to 10-year maturation period in tests of analytic ability. Witkin et al. (1954) found school-age boys higher than girls in this ability, while Kagan, Moss and Sigel (1963) found clear sex differences with boys more often than girls using analytic groupings of objects in the second to fourth grades. Yet at the earlier ages of 4 and 5, boys and girls had equal analytic abilities (Sigel, Jarman & Hanesian, 1963; Maccoby, Dowley & Degerman, 1965).

The aggression accepted as an integral component of male behavior in many cultures (Whiting & Whiting, 1962) adds to the complexity of boys' learning problems, since aggression appears to have a negative effect on intellectual performance for boys (Beller, 1962; Kagan & Moss, 1962). For girls, however, some aggression has been found to be conducive to learning and school success (Kagan & Moss, 1962).

In summary, while sex differences in gender roles and behavior are largely cultural in origin, complex interactions among genetic, hormonal and environmental factors (including psychosocial effects) within the first few days and weeks of life set the stage for the development of gender-related behavior patterns.

By the age 3, children are quite aware of the expectations associated with their sex in their culture. The existence of sex differences in the expected child behavior of boys and girls seems to be universal, although the expectations are not the same in all cultures. Generally, however, males are expected to perform tasks demanding physical strength while females are expected to show a nurturant concern for the well-being of others.

At birth boys are physically about four weeks behind girls in skeletal maturity, and by school age they are nearly a year behind girls. Boys are more physically and emotionally vulnerable to environmental hazards. But intellectually there are generally no significant differences in the inherent abilities of the sexes, although psychosocial interactions that are different for boys and girls can foster or inhibit mental growth. Boys are also somewhat slower than girls in acquiring verbal skills and in motor and perceptual development.

Evidence related to the effects of sex differences on learning then indicates that boys are more likely than girls to have learning and behavior problems because of slower physical maturation rates, less realistic cultural expectations and psychosocial interactions in the early school years (Joint Commission on Mental Health of Children, 1973). Allowances are seldom made for the limitations of boys in early learning situations, so their abilities are frequently masked by aggressive behavior (Tuddenham, 1952), negativism (Forbes & Dykstra, 1971) and low teacher ratings (Brenner & Stott, 1973).

Since relevant physical structures are necessary to support intellectual activities, findings that report boys more negatively affected than girls by early school entry are not surprising. When maturation has had opportunity to occur, however, boys do as well as girls. So at least in Western societies school entrance age laws which mandate the same ages for boys as for girls are not in the interests of the children and should be made flexible enough to accommodate the later maturity of little boys.

# CHAPTER X

# LEARNING TO READ

Synopsis. Those who read easily and early most often come from homes where education is apparently valued and the mothers tend to be fairly well educated. However, other important and positive factors are: relatively quiet activities, little or no television, availability of books in the home, being read to by adults, being "taken places," smaller families, being the first-born or being "taught" by slightly older siblings, regularly assigned home-chores, being able to dress independently, and having sound friendships.

While the foregoing conditions which have been found to be conducive to reading generally, can result in spontaneous learning to read before going to school, this early exposure to reading will not necessarily result in problems in school reading. Young children are not likely to push themselves beyond their ability to achieve. Furthermore, overanxious adults who apply pressures for early reading may be the cause of many cases of so-called reading or learning disability later on. On the other hand, parents and teachers who care, who respond warmly and consistently, who thus create an environment conducive to reading and are supportive of children's efforts, greatly facilitate children's learning to read. Motivation of this kind evidently does more for children's reading than exerting undue pressure to achieve or conducting special early training programs.

In early childhood, intelligence appears to be less important than the social-emotional environment, for learning to read. After the third grade, intelligence becomes more important, although even then its effect may be minimal. It appears that age at school entry, responsiveness to small group instruction and the child's history of success or failure associated with reading experiences, relate most to progress in reading.

While reading difficulties arising simply from pressured use of immature perceptual processes are often called "disabilities" they may decrease or disappear completely when perceptual abilities improve, usually after the third grade. For children who have functional disabilities, e.g., visually, auditorily or neuropsychologically, early detection is important. Special perceptual training programs have a potential value. Still, for normal children, there is little to be gained from these early training programs. When perceptual integration and maturation occurs, most children will have little difficulty with reading.

Children who learn to read words without meaning may also be genuinely handicapped. This problem relates primarily to children who are pressured to read early before they are able to reason consistently and to comprehend the meaning of the printed word. This is common among young children at least through the first grade.

Assuming sensory-motor maturity and the ability to conceptualize--usually by the fifth grade or later--reading skill develops rapidly when a child acquires an interest first, and then discovers that reading can extend his knowledge of that interest.

A child does not learn to read all at once. The acquiring of experience, perceptual skills and symbolic and abstract (cause and effect) understanding is a gradual process. It appears that by allowing time to mature, by providing adequate background before entry to school, and then, along with motivating interest, by allowing the child to approach reading in his own way and without pressure, reading can become a natural, happy and successful achievement instead of a source of frustration for the child.

In a literate culture probably the greatest culmination of early childhood learning is achieving the ability to read. The achievement of this ability becomes a major influence on most later learning, at least as far as structured education is concerned. The ability to read is a highly complex function of the central nervous system (Ayres, 1968) requiring a degree of brain maturation that enables a child to recognize visual symbols and the sounds they represent (Crosby & Liston, 1968). The sounds, in turn, must form words representing concepts with which a child has had some experience (Quigley, 1973).

Conditioned to read. It is not the eye that reads words on the page, but the brain (Krippner, 1971)--the brain with all its stored associations and the meanings assigned to previous experiences. Children who learn to read easily and early have varied backgrounds (Durkin, 1963), but their experiences and certain characteristics in their environments seem to predispose them to an interest in reading.

Durkin found that many children who learned to read at home before going to school came from homes where education was apparently valued. Many of their parents were foreign-born, but the mothers tended to have a high level of education. The families were usually smaller than those of other children, which may have provided more opportunities for child-adult communication. The children themselves generally walked and talked earlier than usual, but were content with relatively quiet activities and had little television.

The influence of the mother on a child's motivation to read has also been reported by Hess (1969) and Hirst (1970). Hess identified maternal behavior and cultural background as key factors, and Hirst pointed out the mother's education as a very good predictor of the child's beginning reading achievement in school. In the first grade reading ability has been associated with such home-related variables as the presence of books in the home, being ready to by adults, and being "taken places" (Milner, 1951).

Older siblings as well as adults may contribute to a child's interest in reading, especially if a sibling is only two or three years older and likes to play "school" (Durkin, 1961). Children learn a great deal from each other and a sibling can unconsciously teach a younger child.

The child absorbs what he is capable of learning without pressure and probably with considerable delight that he is learning to do what his slightly older peer can do.

The joy of accomplishment is a tremendous factor in building a positive sense of worth. Wattenberg and Clifford (1964) found self-concept measures significantly predictive of reading progress. Achievement in nonacademic areas is equally effective in enhancing the self-concept and the ability to read. Responsibilities for home duties and for self-care insofar as a child is able were found by Milner (1951) to be positive factors in learning to read.

Learning to assume responsibility gradually decreases a child's helpless dependence on adults. This may also affect reading success, since excessive dependency has been associated with low achievement in reading among third-grade children (Wells, 1970). And positive correlations with reading achievement were found for third-grade children who were able to dress independently and had regularly assigned home chores (Hoffman, 1971). Being the firstborn and having many friends also had positive effects on reading in Hoffman's study. The experiences provided by parents and later directed by teachers form the foundation on which reading achievement is built.

Factors in reading success. Children may learn to read spontaneously or with teacher assistance. Creating the conditions conducive to reading can result in spontaneous learning to read before going to school, but this will not necessarily result in problems in school reading (Durkin, 1963). Ilg and Ames (1950) noted that children may show a marked interest in letters and words at an early age, but they are not likely to push themselves beyond their ability to achieve. Sutton (1969) observed that the spontaneous reading of kindergarten children did not exceed 20 hours a year, yet resulted in continuous progress. Overanxious adults are the ones who frequently apply pressures for early reading. But pressuring children to perform at a level for which they are not prepared results in many causes of so-called "reading disability" according to Ilg and Ames (1950), and there is no advantage in the long run (Smith, 1965).

Even without a supportive environment and with poorly trained teachers, many children learn to read in spite of severe handicaps (Sheldon, 1970). And Crosby and Liston (1968) strongly suggest that an intelligent child who is neurologically, culturally and emotionally normal will discover how to read all by himself if he is sufficiently motivated and then left to his own devices.

Parents and teachers, however, who create an environment conducive to reading, and who are supportive of children's efforts without exerting undue pressure to achieve, greatly facilitate children's learning to read.

Weber (1971) showed that very poor inner-city children at the third-grade level had met reading success criteria and even exceeded the national norm when certain factors were present. Factors contributing to their motivation and apparently accounting for the reading achievement of the inner-city children in Weber's study were a strong adult leadership, high expectations (which the children were developmentally ready to reach), a supportive atmosphere, an emphasis placing a high value on reading, and additional personnel for individualization of the program.

The factors identified by Weber as contributing to the school reading success of third graders were quite similar in nature to those mentioned by Milner (1951) and Durkin (1963) as positive home influences on reading. This motivation from parents and teachers who care (Sheldon, 1970; Hoffman, 1971) evidently does more for children's reading than pressure (Ilg & Ames, 1950) or special early training programs (Silberberg, Silberberg & Iversen, 1972).

Programs designed to increase children's IQ seem to have little ultimate effect on learning (Bereiter, 1967). And intelligence as measured by IQ tests is apparently less important than the social-emotional environment for learning to read (Durkin, 1962; Balow, 1963; Chansky, 1963; Rudnick, Sterritt & Flax, 1967; Hirst, 1970). Durkin (1962) found that, regardless of IQ, some children learned to read very well at home.

After the third grade, however, intelligence becomes more important (Rudnick, Sterritt & Flax, 1967), but even then the effect may be minimal. Chansky (1963) worked with children 8-14 years of age in remedial reading classes, and could find no support for the belief that a higher IQ contributed to reading progress. Rather, it was age, responsiveness to small group instruction and the child's history of success or failure associated with reading experiences that related most to improvement in reading.

While IQ does not seem to be a differentiating factor in the first-grade reading success of boys and girls, yet girls achieve significantly higher than boys (Balow, 1963). The lower reading achievement of boys in Balow's study has been attributed to a lack of psycho-social readiness rather than to maturational factors. For both boys and girls, however, "maturation sensitive" tests (i.e., tests which clearly differentiate the performance of oldest, intermediate and youngest children) have shown a significant correlation of maturation and reading achievement at the end of the second grade (deHirsch, Jansky & Langford, 1966). And even the relatively rough measure of chronological age at school entry has been positively correlated with progress in reading (Andreas, 1972).

Keister (1941) reported that normal reading progress was apparently possible for under-age children in school, but their reading skills were lost over the summer and were not made up later. Likewise, Freyman (1965) found that children with birthdays in the summer, making them a few months younger than their classmates, were frequently assigned to remedial reading groups and received more than their share of low marks. These disadvantages persisted through the primary school years. Starting to school even a few months later can result in greater reading success (Hampleman, 1959).

_Perceptual abilities for reading_. Although Wepman (1968) concedes that the use of a neural pathway enhances its development so that complete function occurs at an earlier age, he also points out that a lack of perceptual stimulation is not a correlate of poor perceptual learning. According to Wepman, however, maturation and development of the neural system are interrelated. Consequently, perceptual processes function more precisely as they mature. Then using these processes within the limits imposed by maturation assists their development. See on reading, decoding, and brain development in chapter 5.

The use of the visual modality for decoding _serial_ information--as required in most reading programs--generally develops later than the ability to scan. The young child may follow a moving object earlier and more easily than to analyze ever-changing letters and words--shapes which have to be serially decoded. Reading involves both visual-temporal and visual-verbal processing (Rudel and Denckla, 1976).

Reading difficulties arising simply from pressure to use immature perceptual processes are often assumed to be disabilities (Ilg & Ames, 1950). These maturational "handicaps" may decrease or disappear entirely when perceptual abilities improve, usually after the third grade (Rudnick, Sterritt & Flax, 1967; Stanners & Soto, 1967; Frostig, 1968; Morency, 1968). A recognition of the true nature of many reading problems can reduce considerably the pressures and frustrations of remedial reading efforts for youngsters whose primary needs are only time and a supportive environment.

For children who have real disabilities in vision, hearing or neuropsychological functions, early detection is important so that the normal exploration of their environment will be limited as little as possible. Before they reach the age for formal reading and before they are subject to academic failure these children need help in learning to use the perceptual abilities they do have. Satz and Friel (1974) suggest that such children can be identified by an early warning system using a developmental and neuropsychological test battery at the beginning kindergarten age. An assessment of this kind, available as a routine part of children's services, might provide the necessary assistance for handicapped children without subjecting unnecessarily large numbers to remedial pressures which, according to Silberberg and Silberberg (1969), have no long-lasting effect on children's reading levels. There is a great need here for research and for the development of procedures for assessing and treating perceptual problems.

It is possible that cerebral dominance may not be stabilized until after nine years of age (Metcalf, 1974), so reading disabilities attributed to this source may become less apparent as age increases. Much research in this area is relatively new, and conclusions must be drawn with care. The results of ongoing studies are expected to provide valuable knowledge for understanding the neurophysiological and neuropsychological bases of reading.

Earlier studies (Balow & Balow, 1964; Hillerich, 1964) showed no significant relationship between cerebral dominance and reading achievement. Hillerich, however, noted a decrease of 44% in uncertain eye dominance from kindergarten to grade two, which indicates some progress in neurological development. Balow and Balow tested second-grade children, and Hillerich studied children longitudinally in kindergarten and again in the second grade. The conclusions of Wepman (1968) suggest that reading at these ages is probably more perceptual than conceptual in function. Thus the effects observed in these studies of any anomalies involving dominance may not have been as apparent as they might have been in later conceptual tasks.

The maturation of perceptual abilities is reflected in the way children achieve reading success. Many basic reading tasks depend heavily upon auditory processes, according to Flower (1968) and Rosner (1972, 1973). In reviewing research linking auditory skills to reading, Hammill and Larsen (1974), however, were less than sure such skills were usefully related to reading. The degree to which a phonics approach is emphasized may be a variable here. Nevertheless, in the primary grades most children seem to learn more rapidly through hearing than seeing (Budoff & Quinlan, 1964). They also pay more attention to auditory materials than to visual (Stevenson & Siegel, 1969).

At this same time there is a high correlation between poorly developed eye movements on the one hand and problems in learning to read on the other (Grossman & Philips, 1973). Up to age 9 or later visual perception deficits are a contributing factor to reading failure (Frostig, 1968). By the end of the third grade visual discrimination of word segments is well begun and is virtually maximal by the end of the sixth grade (Stanners & Soto, 1967).

From the third to the fourth grade cross-modal perception becomes more important (Rudnick, Sterrit & Flax, 1967) and the perceptual deficiencies of poor readers are not associated primarily with any specific modality (Bryden, 1972). The ability to read well requires an efficient communication between the visual, auditory and somato sensory systems (Ayres, 1968), which is evidently not achieved by most children until this cross-modal perception has been established near the end of the primary grades.

Some children undoubtedly reach mature levels of perceptual maturation earlier than others and achieve sensory integration at a younger than usual age. Yet for most children there is little to be gained from special perceptual training programs. Fortenberry (1969) reported no lasting value from visual perceptual training for word recognition in the first grade. Similarly, Klesius (1971) found no special benefit for normal children from perceptual-motor development programs to improve reading readiness and achievement. Such programs, however, do seem to have a potential value in remedial work with learning-disabled children.

When perceptual integration and maturation has been achieved, the majority of children would apparently have little difficulty with reading if conditions and motivation were reasonably conducive to the task. Until then it is probably unrealistic to expect children to read with any degree of success by adult standards except as they do so spontaneously. Children have their own way of recognizing letters and words and it is quite different from the complex strategies of adults (Williams, Blumberg & Williams, 1970). They employ the same strategies they used to master play activities of the sensory motor-spatial type. They look for rules and meaning to help establish a conceptual framework for written language which they have already internalized unconsciously since early childhood for verbal language (Weininger, 1975c).

Early reading comprehension and school achievement. The ability to read becomes functionally useful only when it serves to convey meaning to the reader. Unfortunately, even children who are considered superior readers and who maintain a high level of reading achievement may have learned to read words without meaning (McCracken, 1966). To some extent this can be as real a handicap as other reading problems in general academic learning. Studies identifying this problem relate it primarily to children who were taught to read early, to perform beyond their ability to comprehend (Reid, 1966; Downing, 1970; Holden & MacGinitie, 1972).

Quigley's (1973) assessment of the pre-reading vocabulary of nursery school children in England showed that most of the children were familiar with less than two-thirds of the words they would soon be expected to recognize in reading books. And a group of 5-year-olds representing a cross section of socioeconomic levels had little precise notion of what reading was all about (Reid, 1966). For these children it was not clear whether one read "pictures" or "marks on paper." They were unaware that letters symbolized sounds, and the concept of word as spatially-ordered letters was difficult to comprehend.

A further investigation of questions raised by Reid (Downing, 1970) of children 4 years, 11 months to 5 years, 3 months obtained remarkably similar results. Not a single child's comprehension of "a word" corresponded with the adult's concept of a word. The children had only a vague understanding of abstract terms and of the purpose of written or printed language.

In the first grade, too, children have been found uncertain of the meaning of "words" and their printed representation (Holden & MacGinitie, 1972). The printing convention is difficult for children to understand because printed word units do not always coincide with their own speech patterns. For instance, "an apple" is easy for an older person to decode, but to a small child the concept represented by these two words may have always been "anapple," a single speech unit. According to Holden and MacGinitie, it is evident that printed speech segmentation is unfamiliar to most children at school-entry age, and they have difficulty comprehending such a convention even when they are taught to identify word boundaries in print.

Brekke, Williams and Harlow (1973) suggested that an understanding of the conservation of substance be taken into account as an additional measure for beginning reading instruction. Conservation is not necessarily learned in school (Vernon, 1965; Goodnow & Bethon, 1966; Mermelstein & Shulman, 1967), but a certain mental age must be attained before a child can perform adequately in tasks of this nature (Keasey & Charles, 1967).

A comprehension of both the purpose of reading and the meaning of the information gleaned from the words read is necessary to achieve full reading success. In the fifth grade, reading comprehension has been found associated with the interest level of the reading material, especially for boys (Asher & Markell, 1973). Assuming sensory motor maturity and the ability to conceptualize, reading skill develops rapidly when a child acquires an interest first and then discovers that reading can extend his knowledge of that interest. This is quite different from the purely mechanical decoding which accompanies a lack of interest in reading.

Heffernan (1968) suggested that experiences that extend and deepen an understanding of the natural and social world, that leave room for creativity, exploration and expression are very necessary for successful reading. For most 5-year-olds, reading is an adult and cultural demand rather than a personally perceived need, and the unready child will feel inadequate, frustrated and defeated. Heffernan attributed the rising number of emotionally disturbed children in part to these early pressures for reading.

According to Durkin (1970), a child does not learn to read all at once; reading is a gradual process. Much of the recent research in this area suggests that it is the acquiring of experience, perceptual skills, and symbolic and abstract understanding that is the gradual process. Weininger (1975c) believes this process begins through play with the child's development of the concept of object constancy, during the second year of life, and that this concept must be developed fully before he is able to read formally. A foundation of visual-motor-spatial-linguistic skills must be built up before school entrance. The child must grasp the abstract conceptual definitions of things in the environment. This enables him to use the symbolic approach to problems. Playing and living in his family environment can help the child to acquire visual and auditory discrimination before he goes to school and then he can take books and explore reading, with the teacher as catalyst and guiding person.

Children enjoy playing with the printed word just as they played earlier with objects and with the spoken word. As reading activities are mastered they ask for more, and teachers must anticipate and be ready to meet their needs. It appears that (1) by allowing time to mature, (2) by providing adequate grounding before school entrance and then, along with a motivating interest, (3) by allowing the child to approach reading in his own way and without pressure, reading can be made an exciting, relatively rapid and satisfying achievement. This simple and natural approach can also prevent the several years of anxiety, frustration and misery which many children now experience, and the permanent loss of motivation and achievement realized by others.

## CHAPTER XI

## EFFECTIVENESS OF EARLY SCHOOLING

Synopsis. Research related to early schooling effectiveness when viewed systematically suggests that early childhood is the best time for preventing the effects of environmental deprivation and for establishing a firm base for effective learning in later years. There is some uncertainty, however, as to what experiences are crucial for these outcomes.

Compensatory education is needed at some time by some children--particularly the disadvantaged. Yet, although a variety of desirable short-term outcomes are claimed by some experimenters, there is no conclusive evidence that in general early schooling programs provide long-range benefits. In fact, research findings generally support the opposite conclusion. For example, for disadvantaged children, preschool experience has sometimes resulted in short-term intellectual and social benefits but there is no reason for such optimism over the long-term. Parent participation often improves parents' attitudes toward school but fails to improve their attitudes about themselves.

While early schooling has been expected to compensate for a lack of positive socialization in the family this, in fact, has not happened. It is true that children from disorganized family systems do not develop the internal control and motivation for normal learning. So an external control is often supplied in a carefully structured school environment. This often makes possible some desired cognitive gains, yet it still does not provide the necessary internal motivation for self-initiated learning. So, gains appear almost inevitably to be lost unless the external structure is continuously maintained. Small group instruction with the same teacher on an adult-child ratio of 1:5 or less may help build motivation. But continuity is also required here and school programs seldom provide these necessary continuous long-range relationships.

IQ gains achieved by preschoolers appear to have questionable authenticity. The lower a child's initial IQ, the greater gains he is likely to make after sufficient experience in a preschool program. However, such IQ gains may really reflect a greater ability to use what was already there. These dramatic gains are not usually continued in early grade school. In fact, a steady decline in IQ, self-concept and also in language and achievement, has been noted when these preschoolers enter elementary school. It appears that even the best intervention programs cannot make up for an inadequate home or inappropriate school experience.

From World War I through the 1950's traditional nursery school programs with a relaxed structure have been of little value in promoting cognitive gains whether or not the children were disadvantaged. The emphasis of these schools was typically social and developmental, with no special efforts to bury intellectual attainments. Still early nursery school attendance then, and yet several years later, generally was not significant in the social and emotional adjustment of the children.

It appears that intensive efforts in general to develop academic skills in the preschool years may be dangerous and shortsighted and correlated with frustration, anxiety and apathy in later school years. Even, as noted earlier, when early schooling appears to enhance school performance, usually this is not adequately realized in later life. Emphasis on parenthood education and family rehabilitation appears to be a far more logical focus than early schooling if we are to insure the child's optimum learning and personal development, which is his right.

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After a review of research related to early schooling, Rohwer (1971) concluded that in order to be effective, a school program must be related to children's present experiences and tasks. The quality of schooling should be judged by the degree to which it helps the student to adapt to extra-school tasks now. Activities and learnings focused toward some nebulous success in the future tend to make school ineffective, especially for younger children.

Many studies have been designed to test the effectiveness of instructional strategies and environmental factors on the learning of young children. The results have shown that children can learn at early ages, they can be trained to perform fairly complex problem-solving operations, and they can achieve IQ gains after participation in school programs (see chapter 9). To make a valid evaluation of the effectiveness of early schooling, however, it is necessary to determine what outcomes are most important with least risk, in the total development of children down through their years. Special care should be taken in analysis of these studies to determine whether or not they involved disadvantaged children. Such youngsters often respond differently from those who are not disadvantaged.

The senior staff of the Harvard Pre-School Project and the Public Education staff of the Ford Foundation (LaCrosse et al., 1970) reported that the available research evidence strongly suggested that childhood was the best time for preventing the stunting effects of environmental deprivation, but what crucial experiences would make possible the necessary development for later success in school were still uncertain. This further suggested that an outcome of early learning experiences (whether in or out of school) should be a firm base which would make later schooling more effective. Preschool and primary programs throughout the country have sought to provide such a learning base. Yet, after all the special methods of instruction and well-planned techniques, massive numbers of preschooled children still do not learn adequately in elementary school (Rohwer, 1973).

Although there appears to be a need for compensatory education for some children at some stage of the learning process, there is no final agreement on the effectiveness of many early schooling programs (LaCrosse et al., 1970) nor on the age-appropriateness of present education practices

(LaCrosse et al., 1970; Elkind, 1969, 1970; Rohwer, 1971, 1973). It might be hypothesized that the frequent segregation of children into age-groups that are largely isolated from adult activities limits experience with the real world, and perhaps weakens motivation as well. Certainly age-based segregation needs further investigation.

The desired outcomes of early childhood education suggested by these reports are (1) the prevention of environmental deprivation, (2) the development of ability to adapt to out-of-school tasks now, and (3) the establishment of a firm base for successful learning later. Insofar as early learnings contribute constructively in general to these outcomes **without risk to the child in other respects** early education must be said to be effective. But these research findings above and others do not provide systematic evidence which suggests that early education should be acquired in school.

Hollos and Cowan (1973) concluded that family ethics and values might well play a larger role than language stimulation and schooling in this respect. Goodnow and Bethon (1966) also note that in the normal course of events children acquire the basic skills for logical thinking in conservation tasks without schooling. These conclusions were based on Goodnow's (1962) work with unschooled Chinese boys in Hong Kong. And Price-Williams' (1961) work among the illiterate Tiv of Central Nigeria suggested that a neurophsyiological readiness led to the comprehension of these logical concepts.

In the United States, Mermelstein and Shulman (1967) found a similar occurrence among unschooled children in Virginia. Six- and nine-year-old black children from Prince Edward County, a community which had been without public schools for four years, were compared on conservation tasks with 6- and 9-year-old black children who had had regular schooling in an adjoining county. The finding of no difference in performance between the two groups of 6-year-olds was expected. But the fact that schooled 9-year-olds performed no better than the unschooled children of the same age indicates that formal, structured learning is not as great a factor as had been supposed for academic achievement in the early years of education, at least up to age 9.

The value of early schooling would seem to come largely from its influence on general development rather than from its "success" in training children to perform certain academic-oriented tasks. Specific training for inducing conservation-type reasoning is definitely questioned by Mermelstein and Meyer (1969). In fact, they suggest that for acquiring some abstract concepts, language and training may interfere with rather than facilitate learning.

There is a pervading tendency to consider schooling effective, especially for the disadvantaged, when children can do what they have been singularly trained to do, whether or not understanding has also been achieved. For example, Deal (1966) noted the improved performance of preschoolers with training and practice on specific mathematics items. But they had acquired no better understanding of number concepts.

Indeed many studies show learning and IQ gains in the preschool years. Yet disturbing questions remain: Does this early schooling provide the essential base for later school success? Does it increase competence to cope with present realities? Or does it further complicate an already complex world? While more research related to these questions is needed, a few clues are appearing in preschool and kindergarten studies with both disadvantaged and middle-class children.

Preschool for the disadvantaged. The effects of preschool programs on disadvantaged children and their families have been scrutinized carefully to determine the justification for continued support by federal, state and other public funds. After reviewing hundreds of studies, Stearns (1971) summed up these effects in three findings: (1) preschools for the disadvantaged have made positive intellectual and social changes over the short run; (2) there is uncertainty about the effects on children's social and emotional development, particularly over the long run; and (3) participation by parents in preschool programs leads to positive changes in the parents' attitudes toward the school but not in their attitudes about themselves. Since some growth and development was observed in the children, Stearns concluded that such programs might be justified as models for research and reform.

Positive effects of these early childhood programs have also been noted in several other studies. A report on the effects of different Head Start programs from 1966 to 1968 (National Evaluations, technical memorandum, 1972) indicated certain specific benefits for disadvantaged children such as significant growth in the cognitive domain, adaptiveness to the Stanford-Binet test conditions, more verbal activity and social interaction with children of other ethnic groups.

Handler (1972) found that preschool experience was important for the disadvantaged because family socialization patterns did not provide adequate training in school-related skills. And Lessler and Fox (1969) noted a sensitivity and receptiveness to the spoken word as the most significant effect of a Head Start program. This might be interpreted as compensation for a lack in the family milieu.

Results of some early school programs have shown that children have enjoyment and enthusiasm for school (Harding, 1966; Lessler & Fox, 1969). It was concluded that children have made progress in learning how to feel, how to think for themselves and how to make use of themselves in learning. They have learned about themselves and about learning, and have felt good about their early school experience (Sprigle, 1974). Better health and social behavior have also been identified as positive preschool outcomes for the economically disadvantaged (Hulan, 1972). Hulan concludes, however, that there is no instant solution or panacea for the cumulative effects of malnutrition or the lack of appropriate infant stimulation and rewarding experiences.

Blatt and Garfunkel (1969) studied the effects of preschool intervention in the lives of lower-class children, hoping to learn what might reduce later intellectual and academic deficits. They expected that good early schooling programs would effectively compensate youngsters who were disadvantaged. Their data revealed, however, that an enriched educational opportunity as offered by preschools is not enough. Rather, for disadvantaged children the home setting, they found, has a far greater potential than external manipulation of the school environment.

Home environments have also been reported at times to have negative effects. In one home-based preschool program of cognitive intervention for children of low-income families, a wide range was found in gains made (Levenstein, 1969). All but one of the seven children who made low gains also demonstrated a common pattern of behavior characterized by social and cognitive immaturity with an indication of unhappiness in family relationships. The home influence was positive, however, for 33 children in this particular program. Parental involvement has been recognized as a vital factor in the present and future academic motivation of children in Head Start programs (Willmon, 1969). The federal Home Start program was in part designed and initiated to develop such family-child interaction (Scott, 1973, 1974).

These findings and programs do not imply that the homes and families of disadvantaged children are all that they might be, even though they do exert a tremendous influence. Indeed, intellectual inferiority has been traced to the lack of opportunity and stimulation so often found in these homes, and compensatory education has been expected to alleviate this lack (O'Brien & Lopate, 1968). But the overriding evidence seems to indicate that "compensatory education" as commonly conceived does not fully compensate. It is second best, a substitute for the primary family force in a child's life.

The Head Start program was the first modern nationwide federal attempt to promote the intellectual growth of disadvantaged preschoolers. Early evaluations of Head Start indicated that factors which contributed to effective programs for disadvantaged children were a warm, supportive and stimulating teacher in a task-oriented, academically structured situation with emphasis on verbal development (O'Brien & Lopate, 1968; Blank & Solomon, 1969).

The structure in these programs was necessary if intellectual gains were to be achieved for disadvantaged or educationally underprivileged children. An investigation of lower- and middle-class preschoolers showed that disadvantaged children expect external control. Less structured programs demand the development of internal control, and internal control or self-discipline is a factor in self-confidence for later success in learning. But for the disadvantaged field this intrinsic quality apparently is best built (or rebuilt) through a relatively highly-structured program. According to DiLorenzo and Salter (1968), DiLorenzo (1971), and Featherstone (1973), the most effective programs for disadvantaged children are focused toward more immediate cognitive gains with highly-structured, teacher-directed experiences.

Bissell (1970) found that the greater a child's socio-economic disadvantage, the more effective a highly-structured program was in producing cognitive gains. The nondirective, less structured programs were more effective with the least disadvantaged. Bissell suggests that the disadvantaged have developed fewer resources to learn by themselves in unstructured programs than have the more advantaged students.

The necessity of structuring compensatory programs has also been reported by Clasen, Spear and Tomaro (1969) and by Larson and Olson (1968) who assessed the effects of an all-day compensatory kindergarten. In this latter case, however, the learning and intellectual growth rates diminished when the focused saturation efforts were discontinued. A follow-through program concept was suggested as a step in remediation.

It seems that the carefully nurtured gains of these structured preschool programs are often lost unless specific and knowledgeable attempts are made to maintain them (Waller & Conners, 1966; Karnes, 1968). In one study of first graders few differences were found between disadvantaged children who had attended a Head Start program with no further intervention and those with no intervention at all. It was concluded that the learning habits of all children were quite well developed by age 4, and intervention after that is not really effective without a planned follow-through (Cawley, Burrow & Goodstein, 1970). Activities designed to increase learning capacities through reading readiness instruction and language training produce their most lasting effects when such special programming is continued through kindergarten and into the primary grades (DiLorenzo & Salter, 1968).

A long-term plan designed to keep children in a continuous sequential program through preschool and the first grade yielded significantly greater intellectual gains than traditional school programs. Children who remained in the program longest (two years preschool, one year first grade) achieved the most intellectual growth. Again, the structured nature of the activities and the continuous, follow-through aspect were credited for the positive results obtained (Van de Riet & Resnick, 1972a, b).

Another tightly-structured type of preschool program is the academically-oriented model designed by Bereiter and Engelmann (1966b, c). Reidford and Berzonsky (1969) field-tested such a program for six months and found that children did achieve an IQ gain. Yet the total evaluation of their findings suggested that long-term programs extending through the early elementary school years should replace short-term programs for preschoolers.

The fast pace and intensive drill in the Bereiter-Engelmann program resulted in the rapid attainment of basic academic concepts and an accompanying gain in IQ (Bereiter & Englemann, 1966a). But there is evidence that this academically-oriented approach can cause later difficulties. Miller (1971) compared the interaction of various Head Start curricula with subsequent schooling and discovered that children who had been accustomed to the Bereiter-Engelmann structure appeared handicapped in kindergarten.

The many affective, cognitive and sensory motor variables discussed in other chapters of this book provide a wide spectrum of rationale which tells the objective ECE scholar that there are many factors which suggest caution--in urging academic structure or stimulation for most young children. Some of them--e.g., a sound self-concept, social stability and untroubled neurological development--may be of much greater relative value for the child's overall development than stress on basic skills. Yet they may be risked if structure and stimulation are overstressed.

Some years after his work with Engelmann, Bereiter (1972) observed that the structured teaching of cognitive skills does not prepare a child for what lies beyond. He labeled the structured approach as training rather than education. Its influence on real development was minimal. The structured approach to young children assumes children who are immature and who are reached better by a sensory approach than by conceptualizing. The former is more akin to training, the latter to education--utilizing the developing ability to reason abstractly. Many behaviorists appear to think of children almost as though they were experimental animals. They are in danger of neglecting the children's potential to develop feelings of freedom, independence and self-discipline, and as a consequence their tightly structured programs often deprive children of opportunities to develop in these crucial affective areas (Weininger, 1975b).

Along with structure and continuity, the most effective schools for young children have a large proportion of adults available to the children (Spicker, 1971). The personal impact of the teacher is a decisive factor in the effectiveness of programs for the disadvantaged. For young children, adult continuity is as important as program continuity. This fact constitutes in general one of the principal advantages of the home. Similarly in a school the same teacher in a teacher-child ratio of 1:5 provides an opportunity to build motivative relationships and to reinforce learning (Hodgins &

Karnes, 1966). Even in the elementary school, small group instruction of this kind promises greater academic success (Frost, 1967).

A teacher-child ratio of 1:1 is even more highly effective in early learning (Palmer, 1968). Positive learning results have been obtained both by tutoring children at home and by teaching mothers to work with their own children on an individual basis (Karnes, 1968). Hamblin and Hamblin (1972) experimented successfully with preschool peer tutoring in a beginning reading program, and for both low and medium IQ children, performance increased with this personal help.

While some programs for disadvantaged children reportedly have met with success in areas mentioned, others failed to produce any particular gains, and some appear to incur losses. Asbury (1970) found a specialized training period for a short time did not result in a significant improvement in cognition related to verbal ability. The Westinghouse report on Head Start (1970) likewise found short summer programs ineffective for lasting gains. In some Head Start enrichment programs no significant differences were found between Head Start and non-Head Start groups in achievement nor in intellectual ability (Blatt & Garfunkel, 1965; Krider & Petsche, 1967; Cline & Dickey, 1968). In fact, Cartwright and Steglich (1965) reported a non-Head Start control group superior to a Head Start group at the end of both the first and second years of school.

Yet some tests of disadvantaged preschoolers show improvement in certain areas when no special gain is apparent in intelligence. Sontag, Sella and Thorndike (1969) reported the significant progress of Head Start children in sensory and number concepts and word associations, but no difference in intelligence when compared with non-Head Start children. Saltz and Johnson (1973) observed progress in both social and cognitive development from training in fantasy play and role enactment, but again there was no improvement in intelligence. Higher scores on school readiness tests have also been noted after early schooling (Seidel, Barkley & Stith, 1967; Turner & DeFord, 1970; Moore & Ogletree, 1973), although there may have been no significant gain in IQ (Jensen & Kohlberg, 1966).

Initially low IQ scores of disadvantaged children do not necessarily represent a true measure of ability. Thus the mental diversity between children of lower and higher socioeconomic levels may not be as great as it appears, even though dramatic (but pseudo) gains in IQ are likely to occur among the most disadvantaged. One evaluation of an inner-city preschool program (Kraft et al., 1968) indicated that the lower a child's initial IQ, the more likely he was to make large gains after sufficient experience with a preschool program. Children with a low initial IQ made their greatest gains in the second year of the program, while those with a higher IQ and in higher socioeconomic levels achieved the same gains during their first year.

The conclusions of Zigler and Butterfield (1968) also raised questions about the authenticity of preschool IQ gains attributed to various programs. The results of a study by Zigler and Butterfield provided evidence that standard testing procedures underestimated the culturally deprived child's intelligence. They suggested that what appeared to be an increase of intellectual ability in preschool children was really a greater ability to use what was already there.

For many disadvantaged children, Head Start programs have contributed to this greater ability to meet the intellectual challenges of kindergarten and first grade (Beller, 1967, 1974; Abelson, 1974). But the dramatic gains of the preschool years were not repeated in early grade school, according to Deutsch, Taleporos and Victor (1974). This could also be indicative of the unrealistically low assessment of intelligence for preschool children who have not yet learned the academic "ropes" used in measuring cognitive ability.

The duration of positive preschool effects on disadvantaged children has been reported to be marginally conducive to cognitive achievement through the first three grades of elementary school (Westinghouse, 1970; Deutsch et al., 1971; Weikart, 1970a, b; Weikart, Deloria & Lawsor, 1974), and it may be evident for four or even five years (Karnes, Zehrbach & Teska, 1974). Weikart and his associates

(1974) found that children who had participated in a preschool program demonstrated higher achievement in the first and third grades than a control group, but their higher scores on IQ tests disappeared by the third grade. The children without preschool had begun to "catch up."

For preschool youngsters a steady though gradual decline in measured IQ begins as early as kindergarten or first grade, even though groups with preschool appear to perform better academically than children with no preschool experience. These nonpreschool children, on the other hand, show a gradual increase in IQ throughout kindergarten and first grade (Miller, L. B., 1972). These results suggest that most of the positive effects of a preschool program are insignificant after a year or two (Hodges & Spicker, 1967; Dunlap & Coffman, 1970).

Larson's (1969, 1972) findings are similar. Significant IQ gains in a Head Start group in rural Minnesota were stable through grade one. After kindergarten the learning rate of the Head Start children lagged behind those with no preschool, and after first grade those who had attended Head Start performed significantly below control groups on tests of word reading, paragraph meaning, vocabulary and spelling.

Similarly, Van de Riet and Van de Riet (1967) found that children from both an experimental Learning to Learn program and a traditional preschool were superior to those with no preschool in a number of developmental measures.

At the end of the first grade, children from the experimental program were still superior in IQ, but the differences between the groups had begun to disappear because the nonpreschool group had improved.

Although carefully planned intervention may lead to IQ gains and better performance in early elementary school (Gray & Klaus, 1965), differences not only in IQ but also in language and achievement that begin to disappear in the first grade are no longer of any significance by the end of the fourth grade (Gray & Klaus, 1970). Gray (1974) concludes that even the best invervention programs do not make up for an inadequate home or inappropriate school experience. The growing child must continually interact with his immediate environment if lasting changes are to occur.

A synthesis of these research findings suggests that the ability of the disadvantaged child to reach current educational standards depends upon: (1) an external control or structure representing limits consistent with the child's functional ability; (2) a continuous program that extends into the elementary grades; and (3) continuity and accessibility of adults, whether they be teachers or parents.

When self-discipline or internal control is a goal of education during the preschool years, the external structure can be less rigid. But according to the evidence reviewed here, cognitive gains are then smaller and develop more slowly. Highly regimented programs often result in greater immediate intellectual gains, but these gains are relatively impermanent unless they are made after the first few years of elementary school. When parents and teachers insist that children formally learn the basic academic skills before age 7 or 8, their learning situations must be laboriously structured in a way which is unnecessary when children are slightly older.

The effects of such regimented schooling on both cognitive and affective development indicates that the disadvantaged child's real deprivation may arise from a cultural discrepancy that leaves internal control undeveloped within a child, as suggested by Bissell (1970) and Stephens and Delys (1973). Without this basis for confidence and self-respect, motivation often lags. It appears that schools may perpetuate this early deprivation when undue pressure is applied for achievement which has little ultimate meaning for the child because of differences that are cultural rather than pathological (Baratz & Baratz, 1970; Rist, 1970).

In commenting on the common characteristics of preschool children from multi-problem families, Friedman (1974) observed that the strong emphasis on cognitive development in their education may be inappropriate to the broader learning process. In his analysis of the early education needs of the disadvantaged, Friedman pointed out that only when developmental maturation is enhanced and supported can children be helped to acquire the personality and cognitive tools for realizing their full potential. The real effectiveness of early education lies more in released child potential than in the quality of information acquired.

The traditional nursery school. The relaxed, loosely-structured curriculum of the traditional nursery school is seldom reported in current research. Such a program has been of little value in helping disadvantaged children achieve cognitive gains (Bouchard & Mackler, 1967). Even with parental involvement and a later enriched classroom experience in the first and second grades, there appeared to be no real gains for the children after three years in a nursery school program at Howard University (Herzog, Newcomb & Cisin, 1974). Nor has nursery school been a determinant of learning for more advantaged children (Handler, 1972). When a relatively high level of proficiency in school-related skills has been acquired at home, notes Handler, a nursery school experience has only a negligible effect on later school achievement.

"Traditional" nursery schools a generation ago. Before the sharply increased emphasis on early cognitive skills that came about in the late fifties and sixties, the programs of nursery schools were of quite a different character than the structured curricula and academic objectives of the current preschools. The traditional nursery schools of those days had little or no orientation to primary readiness. In effect they were care centers which sought to provide optimum freedom in a creative and natural atmosphere without reference to academic knowledges and skills. Research efforts that focused on traditional nursery schools from the thirties to early sixties regularly revealed no significant intellectual effects on children (Anderson, 1940; Goodenough & Maurer, 1940; Lamson, 1940; Moustakas, 1952; Douglas & Ross, 1964; Palmer, 1966b).

A generation ago a year of attendance at a superior nursery school appeared to produce almost no gains in intelligence scores. This superior program, however, was reported as encouraging independent thinking and intellectual curiosity through challenging experiences (Bird, 1940). Such unhurried experiences may have contributed to intellectual development that was not immediately measurable and have provided for the children's affective development.

The usual outcomes of these nursery schools, especially prior to World War II, were personal and social in nature. Moustakas (1952) summed up their greatest contributions as helping children to develop social skills and emotional adjustment. With nursery school attendance children were rated by some researchers as more sociable (Hattwick, 1946), more successful in social contacts (Mallay, 1935), and more outgoing toward other children (Horowitz & Smith, 1939). Their improved social behavior became more acceptable to teachers and other children (Jersild & Fite, 1939), and solitary play merged into integrated group activities (Parten, 1932) which grew more spontaneous with increased social experience (Skeels et al., 1938). The children tended to "grow up," to be more independent and to show more self-control and self-reliance as they progressed in the nursery school (Joel, 1939; Van Alstyne & Hattwick, 1939).

With increasing nursery school attendance, children scored higher on emotional maturity (Joel, 1939). Those schools judged as better sought to encourage attitudes that would help children handle their feelings (Appel, 1942), but conflicts, fighting and quarreling seemed to increase with length of nursery school attendance (Jersild & Markey, 1935). The children became less sensitive to suggestion or criticism, more active and resistant to authority (Andrus & Horowitz, 1938), but better able to disguise or inhibit the outward expression of their fears (Jersild & Holmes, 1935).

In the late 1930's and during the 1940's intellectual development was a controversial question--caught in the great nature-nurture debate. Wellman (1934) and Rhinehart (1942) believed that nursery school could influence IQ, but others were dubious (Goodenough & Maurer, 1940; Peterson, 1937; Skeels et al., 1938; Page, 1940). The general attitude was that a significant increase of the IQ was really not as important as the quality of effective intelligence--original ideas, creativity, productive enterprises, the questions asked and the quality of explanations (Moustakas, 1952).

Nor were the effects of nursery school attendance clearly noticeable in kindergarten or elementary school. In the 1950's nursery school children were sometimes perceived by their later peers as more free and sure of themselves (Allen & Masling, 1957). They were more likely to be chosen as preferred playmates (Angell, 1954), and may have been more accepted by their peers (Brown & Hunt, 1961). But kindergarten teachers' ratings for children with nursery school background were actually lower on personal adjustment and relationships with other children. Brown and Hunt recognized that nursery school enrollments may have been influenced by the emotional needs or desires of parents, and poor personal adjustment could have begun before the nursery school experience.

Early nursery school attendance, in general, was not significant in social and emotional adjustments several years later (Bonney & Nicholson, 1958; Douglas & Ross, 1964). On tests of intelligence and educational performance, Douglas and Ross found that nursery school children made slightly higher scores at age 8 than their non-nursery counterparts. Their scores were not significantly higher, however, and by age 11 they had lost their advantage. By age 15 the nursery school children were slightly below the average of non-nursery school children. Palmer (1966b) reported findings consistent with these in an evaluation of the effects of a junior kindergarten examined over a five-year period. Again there were early positive effects on achievement, but after four years they had disappeared.

There is a dearth of more recent research on traditional nursery schools. But this type of program produces negligible cognitive gains both for disadvantaged children (Herzog, Newcomb and Cisin, 1974) and for children of higher socioeconomic levels (Handler, 1972).

A philosophical question. In 1970 the Harvard Preschool Project and Ford Foundation jointly reported on research and educational practice as related to the first six years of life and called the attention of educational philosophers to the moral and political overtones in the early schooling movement. They questioned the value of accelerating cognitive development in the preschool years, recognizing these years of a child's life as entities in themselves. Although pragmatic reasons for this unbalanced emphasis existed, these undue pressures were pointed out as a possibly dangerous and shortsighted practice (LaCrosse et al., 1970).

The effects of the increased time in school may have negative influences on young children--including poorer attitudes toward schools, the earlier they enrolled (Husén, 1967; Rohwer, 1971). Witherspoon (1968) found some evidence that both the achievement and adjustment of children through the third grade suffered when the length of the school year was extended.

Robinson's (1973) evaluations of early schooling effectiveness led her to the conclusion that intensive efforts to develop academic skills in early childhood are highly correlated with frustration, anxiety, and apathy in later school years. The cognitive focus has fallen far short of producing significant, consistently sustained gains. And Rohwer (1971) observed that even when early schooling had apparently enhanced performance in schools, performance in life was not adequately realized. (For related conclusions, see chapter 13 on early schooling effectiveness.)

# CHAPTER XII

# A POSITIVE APPROACH TO EARLY LEARNING

Synopsis. During the past 200 years a number of ECE movements have attempted to improve social conditions by providing schools for children of the poor. As society became more complex in this century, more affluent parents sought nursery school experience for their children because of its presumed socialization and adjustment advantages. Some parents, however, may have been as much concerned for their own personal freedom--to work or to play--as for the welfare of their children.

The present concern for early childhood education and for out-of-home care is not a new phenomenon, although many of its advocates claim it is based on more concrete evidence than previous early childhood movements. But even this claim is open to question. It is also likely true that the problems of disoriented families are more intense today. A complex technology also has often produced impersonal societies which often undermine feelings of self-worth and happy social intercourse. There is an urgent need to find solutions to these problems. If children are to achieve self-worth and optimal development it is even more important for them to measure up to the criteria of the stable family than to typical school expectations.

It is still by-and-large accepted that the family is the primary educational delivery system for young children. Many early childhood specialists, and others interested in the child's welfare, advocate that the family should have the highest educational priority in the nation. They suggest that programs for parents and future parents should receive society's and government's first consideration.

Family education has been projected as far more productive of desirable child development and far more cost-effective than public care and massive out-of-home programs for young children. A number of programs, such as Home Start, which bring child development services to children and families in their own homes have proved to be highly successful in enhancing the quality of children's lives and providing a base for learning by building upon existing family strengths. The home offers even greater possibilities as an effective learning environment than is commonly realized--even for the years after the child starts to school.

Schools may be able to provide surrogate institutional care and training for young children when homes are inadequate or parents are otherwise unable to fulfill their responsibilities or when other surrogate care, e.g. family day care, is not available. Much research, however, questions the ability of most young children to profit by structured programs commonly offered. Nor will even primary school-age children usually perform well on abstract content until near the end of childhood or in early adolescence. Therefore, much that is learned earlier can apparently be quickly learned at a later age with less repetition and with less apathy and frustration. Emphasis in the earlier school years is then better placed on physical health and affective, motor and perceptual development, with the parents sharing in responsibility and service experiences in and related to the home.

A positive approach to early childhood education suggests a human ecological perspective for child development in relation to the family, the community and the total culture, with priority being given to education in the family.

ECE experimentation goes back more than 200 years (May & Vinovskis, 1972). Jean-Jacques Rousseau initiated ECE change in Europe with the publication of Emile in 1762, teaching that children should begin to develop the skills needed to understand the world and to shape their own future.

Rousseau's ideas that education should be appropriate to a child's development influenced Johann Basedow in Germany, who established a school in 1774 where he sought to stimulate children's reasoning faculties rather than teach through memory only. From 1784 to 1808 Gotthilf Salzmann, also in Germany, advocated the influence of a natural environment in the country. About 1804 in Switzerland Phillipe de Fellenberg founded a similar program, adding agriculture and manual labor to his country program. Such educational opportunities became available to poor children in the 1700's when Friedrich Von Rochow worked to bring schools, teachers, and textbooks to the peasants on his estate near Berlin (Pollard, 1974).

Infant schools, kindergartens, and nursery schools. The Swiss educator, Johann Pestalozzi, was especially interested in the development of the infant mind and encouraged an early learning of vocabulary through familiarity with materials and objects in the child's natural environment. According to Pestalozzi, the home was the only appropriate place for such early learning, and the mother was the best teacher (Pestalozzi, 1898).

The infant school was similar in its day to the nursery schools of our times. The history of the infant school movement in America, reviewed by May and Vinovskis (1972), provides a perspective which somewhat parallels the movement in Europe. A general American interest in the early education of poor children can be traced to the English infant school movement which started in 1816 with the school founded by Robert Owen in New Lanark. A decade or so later America followed the English example and organized infant school societies in a number of areas, including New York City and Philadelphia. By 1828 a number of infant schools were founded in and around Boston, which became the center of the infant school movement in America.

The primary focus was on the disadvantaged--to give religious and educational instruction to children from "unfavorable situations" (Boston RECORDER AND SCRIPTURAL TRANSCRIPT, July 9, 1829), although some private infant schools were established for children of the better classes. This early education of the poor was designed as the primary tool for permanently eliminating poverty.

In 1833, just as the ECE bandwagon was beginning to roll well, Amariah Brigham startled the infant school advocates and the public as well by the publication of his Remarks on the Influence of Mental Cultivation and Mental Excitement upon Health. This book stressed the necessity of giving more attention to health and physical development in early life with less emphasis on the cultivation of the mind. The Infant School Society tried to explain its position as more of a neighborhood nursery than a school, but enthusiasm rapidly declined and the schools soon ceased to function.

The ECE proponents, however, came alive with the kindergarten movement of the 1860's and 1870's. It was largely influenced by the Froebelian curriculum (Froebel, 1896) of games, songs, and nature study, and appeared to flourish with greater public support than had the earlier infant schools. Again the major objective was to alleviate the problems of the underprivileged population by relating education to child development needs.

But now, in addition to the problems of poverty, urbanization and industrialization, a new need was evident in the U.S.--the acculturation of the children of immigrants into American society. In 1874 the National Education Association formally recognized the work of kindergartens by establishing a special department for them. Soon the NEA recommended that kindergarten programs be a part of the regular public school system.

Work for the disadvantaged and low SES children generally continued to be a central ECE rationale. In 1907, Maria Montessori began her work with slum children in Rome, using the idea of a prepared environment to capitalize on the potential of children in their early years (Rambusch, 1962). In 1911 Margaret and Rachel McMillan, two sisters credited by many as originators of the "nursery school" idea, sought to provide in their London school the qualities of a child-rearing environment available in more affluent homes (McMillan, 1919).

After World War I the interest in child development and the programs operated in child-study centers in a number of U.S. universities tended to popularize nursery schools (Anderson, 1956). For the first time in America early childhood programs were established for a purpose other than the alleviation of social ills. While the immediate health and happiness of children ostensibly received due consideration, longitudinal efforts to learn more about children and their development were an integral part of these research-oriented nursery schools (see Chapter 1).

It remained for federal legislation under the U.S. Works Progress Administration (WPA) program of the depression years in the 1930's to generate widespread government subsidies for nursery schools. The American government continued through World War II to make ECE programs available to poor children (Frank, 1962). But aside from these emergency periods, nursery school in the United States was limited largely to children in the middle and upper socioeconomic levels of society until the mid-1960's.

Parents concerned with their children's socialization and adjustment in an increasingly complex society were the ones who sought the advantages which good nursery schools were assumed to provide. There is little doubt that some parents, conditioned by the need for women workers during World War II, may have been as much concerned for their own freedom as for the welfare of their children. Kanter (1972) examined the standard routine of the nursery school experience and concluded that while it may have been a socializing situation, it was oriented to bureaucratic reality rather than to the individual needs of the child. Kanter observed that nursery school children learned little personal responsibility, participated in highly routinized play without internal motivation, and accepted impersonal principles for relating to others. The school had in effect created a child's world resembling a large scale formal organization (bureaucracy), and the child became an "organization child" with adaptive techniques to maintain status but little initiative for individual achievement.

Rationale for early childhood schools. The betterment of society has been the declared rationale running through most of the ECE movements (May & Vinovskis, 1972; Spodek, 1973; Pollard, 1974). Experimenters and social reformers have provided schools for children when homes were deemed inadequate, but philosophers like Pestalozzi and Rousseau have maintained that homes are generally advantageous for early child rearing and training.

The scholars and social reformers of the 1960's who proposed early childhood education programs to remedy the problems of disadvantaged children in the United States were obviously not advocating something new. The rationale for these programs, however, was ostensibly based on more concrete evidence than previous early childhood movements. Yet the quality of this research-related reasoning is held in question. For example, Bloom (1964, 1965) pointed to evidence from studies of child development, of the home environment and of intellectual abilities, suggesting that intellectual stimulation in early childhood was crucial for later educational achievement.

On the basis of his findings, Bloom proposed large scale nursery school and kindergarten programs as the best solution to underachievement. Although early stimulation is certainly important, the kind and quality of such stimulation assumed by Bloom (and many whom he has influenced) has been called sharply to question. Critical analyses of Bloom's position by Bayley (1970), Elkind (1969) and Jensen (1969) raised questions as to the adequacy and correctness of his interpretation.

Bloom (1965) suggested that early childhood programs be made available (1) first for disadvantaged children, and (2) eventually for all children. In spite of the serious questions about the analytical quality of Bloom's work, there is some research basis for his call for ECE programs for the disadvantaged--as suggested in the previous chapter. However, his effort to generalize these ECE stimulation efforts for all children is clearly speculation which unfortunately has no systematic research base. It is much like ordering all children into traction because a few have broken legs.

Bloom concluded that it was very unlikely that parents, particularly those of culturally deprived children, would be able to provide adequately for the developmental needs of their children, and an important task of the schools was to help parents and supplement their efforts. Such assumptions which suggest to some that teachers can outparent even relatively sound mothers and fathers, must be viewed with caution when parents do not have the facts, and with alarm when they do. One of the overwhelming truths that emerges from our study of more than 7,000 ECE research reports confirms what many leading psychiatrists long have said: If we would spend more effort on providing sound homes and educating for responsible parenthood, if we would provide the child a warm, responsive and relatively free and consistent environment, we would develop much more creative and responsible children and save many tax dollars for schools (Fisher, 1951).

Current goals for early childhood education. The problems of disoriented families in the wake of industrialization and urbanization are perhaps more intense today than in the days of infant schools and the early kindergartens. A complex technology has often produced impersonal societies which often undermine feelings of self-worth and happy social intercourse. A study of the research relating to early childhood in today's society shows clearly that above all, a child's early education should contribute to self-fulfillment in the broadest sense (Butler, 1971) with an ultimate goal of achieving a wholesome sense of self-worth and an altruistic regard for others (Gordon, 1972a).

There is an urgent need to humanize preschool education with more attention directed to the day-to-day quality of life and less to program outcomes or results (Katz, 1973). The core of this quality of life is the self-concept. Katz assigns high priority to the goal of helping children achieve a positive self-concept by feeling respected and loved. She points out that the basic criteria by which children judge themselves are acquired very early within the family. Aside from those families which are totally incapable of establishing reasonably sound value systems, or those situations in which the family is broken beyond repair, it is more important for a child's total growth to measure up to the family's criteria than to school expectations. And where families are badly broken a surrogate family is often the best remedy. Whatever the situation, it is essential that adults accept children's differences and treat their feelings with respect.

Gordon (1972a) also emphasizes the self-concept as primary in early childhood education. He identifies the child's search for coherence, for meaning in his world, as central to his total development. When a child can achieve harmony with himself, with others and with nature, he lives in an optimum situation for learning. When early education involves school as well as home, parents and teachers must work closely together supplementing and complementing one another. Gordon concludes that children gain most from such experiences when school and home values are in harmony.

To support a positive self-concept, specific goals to be achieved in early childhood education have been identified by Gordon (1972b) as the development of (1) a questioning, open attitude, (2) a respect for self and othes, (3) a sense of competence, (4) a sense of responsibility, and (5) a sense of commitment. And once more Gordon emphasizes that family factors, especially parental openness, support, respect and sharing, help children attain these goals. He states that parents and families need to be educated to believe in their own worth.

These goals for personal development in early childhood--fulfilling the needs for attention, affection, and feelings of warmth and acceptance--are basic for early learning and for motivation in future learning. In fact, Zigler (1968) concludes that an overemphasis on the intellectual aspect of child development is harmful when these crucial areas of personal development are ignored. Zigler points out that learning is an inherent feature of being human, and when appropriate conditions are established for general development, a child will learn. Conversely, learning can be inhibited by inappropriate conditions that create an artificial environment (Carpenter & Shipley, 1961), confuse a child's values (see Chapter 3), or detract from a child's sense of personal worth (Purkey, 1970).

The caring function, the providing of love, attention and appropriate activities and services are far more important goals of early childhood education than the acquisition of information or cognitive stimulation (Bereiter. 1972). Schools reflect intellectual abilities; they do not create nor even necessarily develop them, and Bereiter, as well as Elkind (1969, 1970), Robinson (1973) and Rohwer (1971, 1975), recommends that schools for young children drop their efforts to direct or shape intellectual development, even into the primary grades.

Priorities in early childhood education. Our educational priorities are in urgent need of reassessment, with programs for parents and future parents receiving first consideration rather than focusing efforts directly toward children (Schaefer, 1972; B. White, 1973, 1974). Strengthening the family for its role in the rearing and education of children, and monitoring the development of children through medical, psychological and educational resource centers and home-visiting programs have been proposed by Barbrack and Horton (1970), Gray (1971) and B. White (1974) as a far less costly and more productive means of early childhood education than generally out-of-home programs.

Cost effectiveness. According to Burton White (1974), developmental day care costs an average of $2,000-$3,000 per year per child. Some suggest much higher costs. Heber's (1970) Wisconsin program, for instance, projected annual costs above $5,000 per child. Parenthood education and parenting assistance for home education of children might on the other hand be accomplished for $300-$500 per year per family. In 1970, Barbrack and Horton estimated that the average cost per child for a home visitor program over a five-year period would be less than $325 per year.

As families become more capable of providing for their own children, the need for assistance might be reduced (Gordon & Guinagh, 1969). This would reduce costs even further. Furthermore, careful home education programs reach not only the parents and the present preschool child, but also, as Schaefer (1970) and Gray (1971) point out, they tend to positively, if indirectly, affect the preschool children to come, and older siblings. Rothman (1973) has suggested the establishment of a generous family assistance program, funded by federal or state funds, so that the poor need not be coerced into using day care centers.

Primitive socieities educate their children almost entirely at home, although they often do have a formal type of education when childhood is about over--puberty rites, etc. But in technological cultures even early education tends to become totalitarian--something imposed from the top downward with parents having progressively less control over their children's education. There is need for parents as well as society to reorder their priorities and to plan for time with their children to give them the confidence and security they need (Suviranta, 1973). Suviranta sums up the situation by urging the recognition of parental duties and responsibilities and of the psychological and emotional impact of the home.

Parenthood education. The necessity of continuous early education for young children is confirmed by a large body of research, but research also confirms the fact that parents are the most influential educators of their own children (Schaefer, 1969, 1973). What parents do in a child's early years in managing the environment, being models for the child and giving information, both directly and indirectly, influences a child's intellectual performance during these years and later on in school (Gordon, 1972b). This power of parental influence if well motivated and directed holds great promise for the child's general psychological development (Butler, 1970). Both parents have a great influence, but educators are discovering in programs for young children that it is the mother who has more influence on a child than anyone else (Jester, 1969).

From findings such as these, Schaefer (1973) concluded that the education profession can best serve children by training and educating parents to care for and educate their own children. This supports Burton White's (1973, 1974) thesis that parent education should receive top priority in education planning, and Gordon's (1969) suggestion that parenthood education is an effective means for bringing about social change.

Parents need not be highly educated themselves in order to be good homemakers and child educators. Successful parent education programs have been conducted by paraprofessionals (Gordon, 1969; Gordon, et al., 1969). It is the quality of family interaction that makes home education effective (Schaefer, 1969), and many parents are already doing the right thing (Gordon, 1972a). From a study of parenthood education using disadvantaged women to instruct indigent mothers in caring for and working with their children, Gordon (1969) concluded that how a child is taught may be more important than what he is taught. He observed that as the mothers' competence and sense of personal control increased, so did the development of their infants and children improve.

In addition to giving parents confidence and personal competence, B. White (1974) stressed the importance of educating parents to understand how children develop physically and socially, how to provide safety and security within the home environment while leaving children free to explore and satisfy their developing curiosity about the world.

White (1974) suggested required courses for parent education in high schools, high-quality public television programs, video-cassette or filmed mini-courses in hospitals, adult education courses and neighborhood resource centers for low-cost early detection and referral services to identify children's educational handicaps. The resource centers and home visiting programs would also provide medical and educational assistance to parents as their children develop. Experimentation with programs of this nature are encouraging. Already the home visitor-parent education approach, using nonprofessionals as educators, has proved unusually successful in producing long-term effects upon children's intellectual performance (Gordon, 1973).

Learning at home. When parents become aware of their worth and responsibilities as teachers of their own children, even a very simple home with meager resources can be a stimulating place for learning. Ordinary household items offer many kinds of sensory experiences, and participation in simple household tasks not only provides opportunities to improve motor skills but also helps to develop a sense of responsibility and of personal worth in the child (Beck, 1973, Bell, 1973; Moore & Moore, 1975).

Programs to bring child development services to children and families in their own homes is based on this recognition of the home as a primary learning center (Zigler, 1971; O'Keefe, 1973). Through paraprofessionals trained as home visitors, Home Start* has successfully served children from a wide variety of cultural and ethnic backgrounds--white, black, Eskimo, Navajo, migrant, Spanish-speaking, Chinese, etc. It has sought to assess nutritional and health needs, to provide information on nutrition, sanitation, safety, and early childhood development, and to provide direct health and social services or referrals when necessary. It has taught parents to use ordinary materials in the home or items from toy-lending libraries to expand the learning resources available to their children.

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*Home Start is an American ECE movement which emerged from Operation Head Start. It uses the home as the primary learning center.

The Home Start program has shown that families definitely want to be a part of a program which supports their own relationship to their children (O'Keefe, 1973). It enhances the quality of children's lives and provides a base for learning by building upon existing family strengths (Home Start: An overview, 1973). Centering the program in the home was designed to produce a better quality program with more comprehensiveness for children's development and learning than was possible with the Head Start type of program (Kapfer, 1972).

Independent smaller experiments with home-centered learning have also been successful in helping parents to recognize themselves and their homes as important educational resources for their children (Guernsey, 1972; McNally, 1973). Guernsey (1972) reported some difficulty for working mothers who wished to participate in the program. This is often a matter of priorities, not only for the mothers who find it necessary to work but also for the society that expects them to assume additional roles.

Young children who remain at home usually have an emotional advantage over those who have some kind of early schooling. Weininger (1974) reported the results of different learning experiences on five groups of young children matched for age, socioeconomic status, and intelligence. Four groups were in some kind of classroom situation, and one group remained at home. After six months all of the children had made about equal intellectual progress, but the "at home" group showed the best emotional growth.

Simpson (1973) sees possibilities in the home as a learning environment throughout a child's education. She points out the opportunities for developing the child's concept of work and leisure at home, and for learning occupational competencies. The learning of ethics, morals, management of resources, and preparation for responsible parenthood may all be home-based. According to Simpson, this could greatly supplement the role of the school and increase its effectiveness.

Delayed academic skills. A positive approach to early learning should make possible the optimum all-round development of children. The weight of evidence from both research and practice reviewed thus far places the home and family well ahead of the school for assuring such development for most young children. What then is the role of the school in the child's total development?

Schools can provide surrogate care and training for young children when homes are totally inadequate or whose parents are personally unable to fulfill their responsibilities for any of many reasons--financial, physical, psychological, maturational, etc. But research has raised a serious question: Is intellectual competence in early childhood, or even in elementary school, necessary or desirable for eventual competence in later education and in life (Rohwer, 1971)? Experiments with paired associate learning led Rohwer to the conclusion that learning skills are more easily developed through training during adolescence than in early childhood. While the base for developing learning skills is acquired from the environment and from the experiences and relationships of early childhood, Rohwer found that the ability to make use of formal instruction and to retain abstract content is not achieved by most children until near the end of childhood or in early adolescence.

Rohwer (1973) envisioned an elementary school in which academic failure would not exist because the children would work on projects or topics using nonacademic resources. Then, in the junior high school years "all the learning necessary for success in meeting high school demands (could) be accomplished." Rohwer (1973) also expressed the belief that delaying formal instruction until the early adolescent years would increase the ultimate degree of academic success and decrease the negative attitudes toward school that appeared to develop in proportion to the years spent in school (Rohwer, 1971; Husén, 1967; Dunn, 1968). Research in the areas of neurophysiology and neuropsychology strongly and generally support Rohwer's thesis. His proposal could have further merit in that it would avoid the "intellectual burn" of children who struggle to keep up with academic activities before they are ready for total intellectual involvement (Elkind, 1969).

Based on the conclusion that compensatory school programs focused on the primary grades have not produced significant or sustained cognitive gains, and that intensive efforts to develop academic skills in early childhood appear to be correlated with apathy and reduced academic accomplishment in later school years, Robinson (1973) also proposed early adolescence as the best time for academic learning. This could be especially advantageous for deprived children whose cognitive skills have developed slowly.

Proposals like this do not mean that no attention would be given to children's learning prior to their adolescent years. It is quite probable they would receive more satisfying attention than in traditional school programs, but the emphasis would be on physical health and affective, motor, and perceptual development. With such a foundation, cognitive skills could be acquired easily and rapidly, even by children who would normally find school achievement difficult. Even when those who start a year or two late are started in the second or third grade they usually catch up with their peers and often pass them. And usually they come out better behaved and better socialized as well as higher achieving. In order to accommodate such late entrants administrators should insure that the usual lock-step progress through elementary school is not required (Moore & Moore, 1972; Moore & Moore, 1975).

*An ecological commitment*. Schaefer (1971, 1974) points out the need of support for family care and education of children in order to maintain a life-space or ecological perspective for child development. The current focus upon professional and institutional resources for developing the individual apart from his family and cultural heritage has sometimes produced personal isolation. Families, however, are not always adequate for the job without some assitance. A focus upon the development of children within a family and community network or system would provide more supportive relationships (Schaefer, 1974).

Crowded urban areas and family disintegration have particularly contributed to personal isolation. Cities have become places where people learn to live without natural resources, where the rights of children are minimized, and a deteriorating environment influences human development and behavior (Bauch, 1971). The major influences on learning in early childhood grow out of a child's total ecology--the immediate home and school setting and the larger geographic setting and social system which affect the immediate setting (Bronfenbrenner, 1974). Positive progress in learning and development for all children depends on an integration of these factors.

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# CHAPTER XIII

## SUMMARY: ISSUES AND RECOMMENDATIONS

Regardless of funds available and approaches used, the early childhood education programs *generally* available today are not meeting the needs of children nor correcting the results and failures of child-rearing practices in children's early years (Schaefer, 1972b; B. White, 1974). It seems that priorities have been skewed, and the assumption has been that children become educated through contact with a professional in a classroom or a center. After nearly two decades of full-time research with children under 6 years old, Burton White has concluded that the family is the primary educational delivery system. He believes that the highest educational priority in the nation should go to the family, not to developmental day care centers nor to any of the preschool programs that abound. Similarly Sheldon White, after making a comprehensive study of federal ECE programs (S. White, 1973) expressed concern that the early schooling movement "might wipe out the gains special education has made and possibly ruin the future of early childhood education." (Moore & Moore, 1972).

The centrality of the home versus the school for the young child's education is a primary ECE issue today.. This does not mean parent involvement in school activities but full-time child and parent involvement in the home and its related activities wherever possible. At best the school is a substitute and the teacher a surrogate during the first six or seven years of life. We should be concentrating on educating for parenthood and improving the home, rather than on providing alternates, except in those cases where the home cannot be made viable as the primary environment for the child. Many times it will be necessary to resort to substitutes and surrogates but if we are to build sound children every effort should be made to minimize such institutional life for the young child and maximize the home influences.

Some ECE issues are more clearly defined than others, but most of them are interrelated. For the most part the studies tell their own stories, and comments have been reserved for summaries and areas in which clarification was needed. These early childhood education issues are basic to the stability of society. It is both necessary and urgent that conventional wisdom, traditional practices and current trends be evaluated against the questions and evidence arising from early childhood research. While some critics have insisted that there is much evidence contrary to the findings of this review, they have not yet made it available. Some key authorities on ECE literature have repeatedly declared that it does not exist.

In recent years, thoughtful early childhood education specialists who had strongly supported early schooling have reversed or sharply modified their positions because of the results of their own research and that of others. An overview of the entire early childhood problem suggests certain ECE issues which deserve careful and objective study.

Relative effectiveness of early schooling. An important challenge is here placed before educational planners, legislators, trustees, administrators, teachers, parents and those concerned about the welfare of society, culture and country. Perhaps most of us tend to equate learning with schools, when the home, during the child's earliest years, appears from the preponderance of research evidence to be his most likely learning laboratory. We also often equate low SES homes with disadvantaged children and move on to compensate for the assumed "disadvantage" by removing the children from an environment that may actually be best for them, and thus in fact be disadvantaging them all the more.

There are, of course, many truly handicapped and otherwise disadvantaged youngsters at both high SES levels and low who require the structured programs of good preschools.

Yet this provides no logical reason for generalizing this need and therapy to children who are not disadvantaged, anymore than we hospitalize all children when a few have the "flu." Nor is there yet any reasonable assurance that preschools in general are as well run as those model schools so often used by researchers, even if they were as effective as the home. In fact, research is in order to determine if in most communities the school's basic environment is any better in general than the homes.

There is some reason to believe from an analysis of 80,000 young children from the National Elementary School Survey (HEW) that other than providing a publicly supported babysitting service, preschools are not generally serving our children well (Moon, 1975). If indeed we are simply providing out-of-home care let us call it that, do it only where it is really needed, and do it very well, encouraging and educating parents where they can to care for their own. There is no research in this chapter or in this book or elsewhere on record which effectively and systematically leads to any other conclusions if we are primarily and objectively concerned with the welfare of little children.

Family restoration or personal accommodation. We must determine whether or not we shall appropriate established facts of human ecology to restore family life or to accommodate those who may place personal expedience and conventional practices ahead of family welfare as, for example, sending children to preschool because it is in style or convenient. To follow a trend that leads to negative outcomes is defeatist and uncharacteristic of a progressive people.

Home or school as the basic ECE delivery system. The school and other out-of-home care for young children must be evaluated against parent and home education. Out-of-home care must be provided for children whose parents cannot care for them, whether for physical, emotional or financial reasons. Yet, wherever practical, as pointed out by Nimnicht (1972), B. White (1974), and others, the home should be the primary ECE delivery system. Such a philosophy and practice need not deprive present preschool personnel of employment as is so often feared. Some teachers need to change their focus from the schoolroom to the home or to parent groups. Parents need to be educated regarding the developmental needs of their children and how best to meet these needs. In any event, the child's welfare must transcend employment concerns of teacher groups, and should be carefully weighed in making decisions for parental employment.

If the school must provide the care, then let it be as much as possible like a warm, responsive, consistent home. Following are some of the qualities and/or practices which our studies (Moore, Kordenbrock & Moore, 1976) have found to be characteristic of outstanding preschools and care centers:

(1) Staffing with warm, responsive, consistent teacher-caretakers,

(2) Maintaining small adult-child ratios,

(3) Using residential houses where possible instead of school buildings,

(4) Grouping of children in house rooms instead of classrooms with children placed in family-type play groups, varying the ages,

(5) Alertness to the frequent need to compensate for language and cultural differences,

(6) Providing daily homemaking experiences including gardening, cooking, cleaning, etc. in lieu of more conventional kindergarten play,

(7) Programs free from formal teaching, academic orientation or even primary stress on readiness for the primary grades,

(8) Scheduling adequate nap and other rest periods for all children,

(9) Continuity of teacher personnel,

(10) In the teachers a sense of parenthood-more-than pedagogy.

Family authority and responsibility. Who is primarily responsible for children? Assuming that authority and responsibility are commensurate, we are led to conclude that if parents are to have authority over their children, they must also accept responsibility for them. To the extent that parents delegate this responsibility to others, they abrogate their authority. Suviranta (1973) has noted that this shift of responsibility has already gone so far that education is in danger of becoming totalitarian with parents having few rights, even when the best interest of the child is at stake. In recent months and years a number of American mothers have been arrested, and one recently jailed, for conscientiously keeping their children at home at ages 6 or 7. This appears to be a violation of constitutional freedom, if not of motherhood.

Parenthood education. From the child's earliest years the child should be kept in mind as a future parent. This is a primary obligation of our schools at all levels. Yet the immediate needs of parents and expecting parents should be a continuing concern through programs of all kinds, utilizing the wisest and most effective means of communication: television and radio spots and shows, printed media, community agencies, etc. The prime objectives of such programs should be to alert parents to the developmental needs of their children, to restore confidence in themselves as parents, and to follow through with a responsiveness to their children that is warm and consistent without the urge to be pedagogues.

Freedom for parents or children. This should never be an issue, but it is. Mothers sometimes desire freedom from home duties, including child care, in order to work or otherwise be at liberty. For some this is financially necessary, but for many it is not. In some cases the father's employment may be subject to question. The question, however, remains:

If the child's best interests require a warm, responsive parent, does it become a violation of his liberties to have the parent unnecessarily abrogate his responsibilities? Is this really parental freedom? Or is this license? If a child's freedom to develop into a productive person depends substantially on the quality of his parental attachment, does a lack of attachment impose an unnecessary limitation on the child's freedom? The issue is a poignant one when policy permits or encourages parental self-interest in the face of the child's helplessness.

Care of privileged or underprivileged. Children of the poor or underprivileged more often need carefully planned, out-of-home care than do the children of more affluent families. But some people insist that if public funds provide special services for the poor, they must also be available for all children. This reasoning, if logically extended to all areas of welfare, would ultimately lead to a total, and fiscally improbable, welfare state. Even now, according to the Wall Street Journal (August 6, 1975), "There are already more Americans (80.6 million) being supported by tax dollars than there are workers in the private sector (71.6 million) to support them."

Early screening. Yet early screening systems employing physicians, psychologists and/or alert and well-prepared teachers, should be established and made available for every child. This will greatly help in determining the nature of the child's problem, if any. Physicians should be alert to symptoms at birth, but the child should wherever possible have a yearly check, and particularly at or before school entry. This will go far toward eliminating school failure and incorrect assessment of student problems.

Home or school socialization of the child. One commonly advanced rationale for early schooling is that it socializes young children. This idea needs to be carefully examined, for the facts appear to indicate otherwise. According to accumulated evidence from comparative entrance age studies, children who start early to school are often found to be socially immature. Approaching the problem from another point of view, teachers have subjectively found that early school entrants are more likely to have social maladjustment problems as they progress through school. The belief that young children need more social opportunities than can normally be provided by a combination of parents, relatives, and neighborhood friends does not seem to be supported. In fact, in urban, suburban, rural, and even remote areas it appears that most children develop better socially at home than in school. Exceptions, of course, may be those homes which cannot provide reasonably sound parenting because of severe physical, emotional or financial difficulties--or parents may be ignorant or apathetic. Often overlooked is the child's equally important need for solitude to work out his own fantasies--a basic activity for true sociality.

The child's need for cognitive stimulation. Another of the most frequently heard reasons for early schooling is the mental stimulation it provides. This concern is not consistent with research findings related to early learning. If, as neurophysiologists suggest, brain structure and function move along together, it would seem that to require a child to undertake tasks for which he is not fully prepared may be risking damage to the central nervous system, as well as potential difficulties in the affective and motivational aspects of learning. Recent findings in the area of neurophysiology, cognition, vision, hearing, etc., have raised serious questions about expecting children to pursue the basic skills of reading, writing, and arithmetic on a deliberate academic basis before they are 8 or 10 years old, and their neurological, cognitive, and affective development has reached reasonable levels of maturity--an integrated maturity level (IML) or safe time for school (Moore & Moore, 1975).

If we expect a quality of reading and arithmetic based on understanding rather than rote learning, delay in these areas appears wise. Some scholars conclude that it would be better to wait until ages 10 to 14, or early adolescence (Elkind, 1969; Robinson, 1973; Rohwer, 1971). Freedom within limits that permit the child to explore and test his own ideas appears to offer the best kind of "stimulation" most children need. There is strong clinical and research evidence that childhood motivation for learning is often destroyed by early exposure to the so-called stimulation of school. And by grades three or four many children find themselves on a motivational plateau and never recover their early excitement for learning.

Children's attitudes toward school. Many parents think their young children are excited about school. This suggests many questions. Do children really enjoy school more than home? If they do, why? What of the quality--warmth, consistency, responsiveness--of the home compared with the school? Are homes really lacking in things that can interest young children? Or is it the social and psychological pressure of everyone doing it that encourages early schooling? Studies clearly indicate that the earlier children go to school the worse their attitudes eventually are toward school, particularly as they enter their teens (Husén, 1967; Husén, 1972; and Liljefors, 1974). On the other hand, much experimentation is due with parents and homes in order to provide sounder bases for parent education.

Structure or freedom in the young child's learning. While many preschools presumably have an unstructured curriculum, most are readiness-oriented for reading, writing, arithmetic, language arts, etc. Research apparently indicates that structure or regimentation are helpful if one is determined to teach academic skills before the young child is ready. This is much like the formality of holding a young child up by his hands in order to help him to walk before he is ready. The question here is, why make him walk? If we are not worried about rushing a child into the basic skills, a virtually unstructured program with warmth, consistency and concern for the development of a sound system of values but without a particular orientation to basic skills, appears to provide the best readiness for learning.

Parents as teachers. An alarming number of parents appear to have little confidence in their ability to "teach" their children. Research suggests that their ability to care is the criterion of parenthood during the early years. Parents should be helped to understand the overriding importance of incidental teaching in the context of warm, consistent companionship. Such caring is usually the greatest teaching, especially if caring means sharing in the activities of the home--which for the young child represents his foretaste of mature living. No evidence has been found for the common assumption that teachers can outparent parents, as a general practice.

Natural and enriched environments. There is reason to question an emphasis on special materials and equipment for learning in a child's environment. A clutter of toys can be more confusing than satisfying. On the other hand, natural situations with opportunities to explore seldom overstimulate or trouble a small child. Furthermore, most children will find greater satisfaction and demonstrate greater learning from things they make and do with their parents or other people than from elaborate learning materials.

Cost of effective child care. An appropriate adult-child ratio is vital for children's development and learning (Meers, 1970). But the cost of providing the number of adults necessary for the optimal care of small children is high. Excellent parent and home education programs have been implemented, however, at much lower costs than well-planned preschool or day care programs.

There are costs in child services that sometimes lead to confusion between educators and social work personnel and between the relative responsibilities of family physicians and publicly provided medical care. The costs of child care and child services must be evaluated from professional perspectives rather than political. Otherwise the entire early childhood program may well be sacrificed (B. White, 1972).

School entrance age. The evidence overwhelmingly favors later entrance for most children. A nongraded primary room as a screening, adjusting facility for children of varying degrees of physical and cognitive maturity would normally appear to be the most efficient means of handling 8-year-old school beginners. Some would already know how to read but would be unable to write or do formal arithmetic, and some would have had no background in these skills.

Letters from nearly 300 correspondents who have entered school at age 8 or later indicate that even in conventional school programs average youngsters can quickly progress and catch up with those who started school several years earlier--in motivation, achievement, behavior, sociality and leadership. When they enter school these older children should normally be placed with their chronological and/or maturational peers.

There are many variations in state school laws, mandating enrollment anywhere from 8 years down to 5 3/4 years or younger. Seldom do they provide for the later maturation of boys, but dropout and delinquency statistics suggest that boys are disadvantaged by such laws. Either such laws (1) should be reformed to provide the needed flexibility, (2) should be tested at highest juridical levels, or (3) a national law should be enacted setting general enrollment-age parameters consistent with systematic research evidence.

Differentiating treatment of various socioeconomic levels. As pointed out earlier, it appears impractical to demand the same tax-supported assistance for middle and higher SES groups as may be necessary for those in poverty. Such an attempt carried to its ultimate logical conclusion would result in a welfare state. Some special services such as medical and psychological screening, are better handled for all children by public health or other agencies. But general early childhood assistance should be reserved for those who are incapable of providing it.

Successful parenting, however, is not limited to middle or upper income groups. There are indifferent parents at all levels of society, and some of the best parents are found among the economically disadvantaged. So any plan for parent education, while first perhaps considering the poor, must not overlook the others.

*School and community parent education*. It is imperative that there be close cooperation between the schools and other community agencies for good parent education programs. Whether the primary responsibility is assumed by the school or by a community agency, the development and needs of children must be the central focus of such education.

*Research analysis and application*. There is serious need for long-range ECE studies which project present practices 10 or 15 years or more. With only occasional exceptions (Davie, Butler & Goldstein, 1972; Mawhinney, 1964; Forester, 1955), ECE studies have covered relatively short time spans. Appraisals of Headstart and other programs have often been inconclusive for this reason. Meanwhile the synergic effect of analyzing and interrelating studies from the several ECE areas may provide much information of value.

To gain as much understanding as possible of the real issues involved, research must be interrelated from all areas pertaining to the problem. At the same time, an effort should be made to simplify explanations and clarify the findings. The use of complex or peculiarly professional terminology to obscure the message must be avoided. Data from carefully controlled studies can thus be available to educational planners and policy makers. At times even clinical data, when carefully evaluated, can provide clues for further study and action.

Finally, it has long been assumed that researchers should not be advocates; that advocacy dilutes objectivity. Perhaps this was wrong, for this assumption seems to be one of the reasons that ECE facts from the various disciplines have been so scantily interrelated and poorly communicated. Truth is often threatening to those who find security in conventional practices. Yet when expedient ways and conventional wisdom are subjected to honest scrutiny, their basic qualities are revealed. Such scrutiny is necessary if ECE research is to benefit children fully. The trends of the times which do not clearly serve the needs of children must be reevaluated and, where necessary, policies and practices must be altered if children are to realize their maximum potential. Attention to the total development of children is insurance for the healthy survival of our society and of civilization.

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